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Mosquito Vectors and Inapparent Animal Reservoirs of St. Louis and Western Equine Encephalitis Viruses*

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IT seems particularly fitting to discuss here in St. Louis some recent findings on the epidemiology of the encephalitis named for this city and county.

The St. Louis epidemic of 1933 [1] was up to that time the largest localized encephalitis epidemic recognized to have occurred in North America. And, only one other epidemic of encephalitis has surpassed it in numbers of cases and deaths—that of the western equine type which occurred in and about North Dakota in 1941.[2] The St. Louis disaster remains the most important outbreak caused by the St. Louis virus.

Since the virus of western equine encephalomyelitis is responsible for an epidemic infection of man epidemiologically closely parallel to that produced by the St. Louis virus, the two will be discussed together. Emphasis, however, will be placed on the St. Louis type.

Now, nine years after the original St. Louis epidemic, we feel that we are able to throw some definite light on two of the remaining unsolved problems: (1) the mode of spread, (2) methods of control. These findings which we present result not from our work alone, but culminate from all the excellent work which has been done previously.

The evolution of the problem can only be reviewed very briefly in order to permit even a sketchy presentation of the new findings. Even so, the details and numerous protocols of the laboratory experiments will have to be presented in a separate paper.

In summing up the epidemiological data at the end of the 1933 epidemic it was reported that either mosquitoes were involved as vectors, or the infection was spread by contact.[3] Mosquito

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transmission in the laboratory was attempted at that time but failed.[3] Some were inclined therefore to believe more strongly in the contact theory. We now understand, however, from a better acquaintance with the behavior of the virus in laboratory animals, why these early attempts at insect transmission were doomed to failure.

Since the original outbreak in St. Louis other encephalitis epidemics have been recognized as predominantly due to this virus,[4, 5] and there have been mixed St. Louis and western equine outbreaks.[4, 6–11] It is interesting to note in connection with this that horse infections of both a clinical and an inapparent nature have been produced by inoculation of the St. Louis virus.[12–14] Similar to findings reported for the equine viruses, and contrary to earlier belief, the St. Louis virus, following a dilute subcutaneous inoculation, has been found readily in the blood of chickens,[15] ducks,[15] doves,[16] horses,[13] mice,[17] monkeys,[18] guinea pigs,[15] and a rabbit.[15]

Antibodies to the St. Louis virus have been found in the serum of normal persons and in those convalescent from encephalitis in many parts of the United States and even in Africa.[4–11, 19–22] Antibodies have also been demonstrated in the serum of horses and of numerous other vertebrates, both domestic and wild.[9, 10, 13, 21, 23–26]

From the epidemiological standpoint certain very significant findings have resulted from a recent series of closely correlated field and laboratory studies made in the Yakima Valley, Wash. Both St. Louis and western equine viruses were isolated repeatedly from one species of mosquito, *Culex tarsalis* Coq.[27, 28] Antibodies to both viruses were found in as high as 50 per cent of apparently healthy domestic fowl in that area[23, 24] and also in a high proportion of fowl in other areas.[25, 26, 29] No antibodies, or in some instances a very significantly lower percentage, were found either in animals from control areas or in laboratory bred fowl.[24–26, 30, 31] These data again suggested mosquito transmission, and in addition a large inapparent vertebrate reservoir for infection.

Mitamura and associates in Japan had previously claimed mosquito transmission of St. Louis virus by *Culex pipiens* var. *pallens* Coq.[32] (This same species of mosquito was found in large numbers during the St. Louis outbreak, although the particular variety was not reported.[2]) However, others in this country have failed to obtain transmission with *Culex pipiens* Linn.[3, 33] Recently, using *Culex pipiens* Linn. from California (variety at present not determined) we effected transmission to doves, baby mice, and pigeons.[16] Blatner and Heys, in St. Louis,[34] in experiments with the dog tick, *Dermacentor variabilis* (Say), likewise recently proved that arthropod transmission was possible. However, epidemiologically, there has been no particular reason to believe this tick was an important vector during any outbreak. In St. Louis, a late statistical study made by Casey and Broun pointed to mosquitoes as probable vectors.[35]

Many of you are acquainted with the extensive successful transmission of the western and eastern equine viruses, beginning with the work of Kelser.[36] Reviews of these have been presented elsewhere.[37–39] *Aedes* mosquitoes, the wood tick,[40] and a cone-nosed bug[41] have all been shown to be potential vectors. Epidemiologically, *Aedes* have always been considered as likely vectors. The evidence is generally held to be strongly against contact transmission for the equine viruses.

In regard to possible contact transmission of either virus there are several significant observations to be considered. Several animals can be readily infected by intranasal instillation of a

suspension of either virus. Infection by feeding however is much more difficult.[42] St. Louis virus and western equine virus have both been isolated from the nasal washings of horses inoculated by the intracerebral route.[12, 43] Neither observation has been confirmed yet by other workers and from reported failures it seems probable that the amount of virus present, when detectable, is small. Although attempts have been limited, neither virus has been isolated from nose and throat washings, urine, or feces of man or horse during naturally acquired infections.

From the Yakima Valley studies, reviewed above, in regard to finding antibodies in animals and to isolating viruses from mosquitoes which feed on these animals[44] and from much supportive laboratory work, we felt justified in forming a hypothesis, for both viruses, of a mosquito-animal-mosquito cycle. Hypothetically, for this area, it seemed likely that mosquitoes became infected principally from animals which fulfilled the following criteria: (1) they should be abundant; (2) they should show no apparent signs of infection, because no epizoötic had ever been observed, except in horses and horses were relatively few in number; (3) they should have as a result of a small peripheral inoculation a reasonably large amount of virus circulating in the blood for more than a fleeting period of time; (4) it should theoretically be a bird because in an area where epidemics occur annually the reservoir animal should be one which does not bestow a first season's protection to its offspring by maternal transmission of antibodies, as frequently occurs in mammals. This is because laboratory experience has indicated that very young animals tend to react with higher blood-virus titers than older ones, thus are better potential sources of infection for an insect vector. This advantage would be lost if the animals were rendered immune for the first few months of life by maternal antibodies. For the Yakima area young domestic fowl best fit all the above criteria of this hypothetical reservoir.

Since all known vertebrate infections have been of short duration and laboratory mosquito infections have been occasionally lifelong, a mosquito which winters in the adult stage, such as *Culex tarsalis* in some areas, might be advanced as a hypothetical vector for the Yakima area. It is found frequently in domestic habitats, feeds readily on domestic fowl, and was found infected in nature.

The question then, was, would this mosquito become both *infected* and *infective* with each of these two viruses as a result of feeding on domestic fowl. Our crucial laboratory experiment was thus outlined. We attempted to reproduce in the laboratory this hypothetical cycle, believed to occur naturally (mosquito-fowl-mosquito). This was not the usual type of laboratory experiment using standard laboratory animals and inoculating by highly artificial routes resulting in characteristic disease patterns and death. Nor did it employ a mosquito readily adapted to a laboratory cage colony. Instead, the animals and mosquitoes suspected were brought into a carefully screened field laboratory in the epidemic area during the epidemic season and only suspected natural routes of infection were used. No deaths or signs of illness were expected in these animals.

To determine the presence of infection in our experimental fowl, since they showed no sign of disease, it was necessary to bleed at the right time following the infective mosquito bite, and test the serum for virus by intracerebral inoculation of mice. We first determined the period during which the viruses could be detected in the blood following subcutaneous inoculation, a route which was our best means of

simulating a mosquito bite. Both viruses were usually demonstrable from about 18 hours after inoculation until 60 to 72 hours. For a single test to determine the presence of virus, 48 hours turned out to be convenient and best suited to both viruses. Further evidence of infection was obtained by making tests for antibodies on the serum drawn 15 days after inoculation. These antibody responses were usually clear-cut, but never accepted as conclusive without previous virus isolation.

The selection of suitable virus strains appeared to be of great importance. Work with the eastern equine virus,[45] yellow fever virus, and others had previously indicated that any virus which originally had the ability to invade other than neural tissues tended to lose this affinity after repeated direct brain to brain passage. This, of course, is a highly artificial route of infection, one never occurring in nature. We felt that any old " brain fixed " laboratory strain might give misleading results. We therefore used almost exclusively strains of viruses recently isolated from mosquitoes and after not more than 4 passages in the brains of animals (western equine strain F199 and St. Louis strain F103). Both fresh strains of virus had been carefully identified. Using an old laboratory strain of western equine virus delayed and hampered our work with that virus, work which was limited by the shortness of the season during which mosquitoes were available.

We used incubator chicks which were kept in mosquito free quarters for 4 to 8 weeks before use. Mosquitoes were all derived from larvae brought into the laboratory.

The fowl-insect-fowl experiments reported here were performed in a temporary field laboratory in Yakima during the summer of 1942. Virus identifications and isolations from frozen serum and mosquitoes were carried out in the San Francisco laboratory.

ST. LOUIS VIRUS EXPERIMENTS

Preliminary transmission of the St. Louis virus to chickens by *Culex tarsalis* infected by feeding on a blood-virus suspension had been accomplished in our Texas field laboratory and has been previously reported.[46]

In Yakima the St. Louis virus was repeatedly transmitted by *Culex tarsalis* from chicken to chicken during the course of two experiments. (One protocol is given in Table 1.) This same species infected from a duck transmitted the virus to chickens at various intervals during another experiment. Transmission occurred after an incubation period of 8 to 16 days in the mosquito at a temperature varying between 78° and 90° F. (night and day variation). The humidity was kept relatively constant at 85 per cent. Most transmission tests were begun 10 days after the mosquitoes fed on the infected fowl and no experiment with the St. Louis virus was prolonged over 21 days. All fowls serving as a source of infection had been inoculated subcutaneously 48 hours previously with a dilute suspension of infected mouse or guinea pig brain. In previous experiments under higher incubation temperatures with mosquitoes infected on a blood-virus suspension, incubation periods were occasionally as short as 4 days.

By feeding on blood-virus suspensions we have succeeded in demonstrating transmission, as previously reported, by *Culex pipiens* [16] and by *Culex coronator* Beyer.[46] More recently, in addition and not previously reported, by *Aedes lateralis* (Meigen), *Aedes taeniorhynchus* (Wiedemann), *Aedes vexans* (Meigen) and *Theobaldia incidens*. Here are potential vectors among three *genera* of mosquitoes and in addition, as reported by Blattner and Heys,[34] a tick, *Dermacentor variabilis*.

WESTERN EQUINE VIRUS EXPERIMENTS

Work with a suitable strain of western equine virus (F199) has been more limited. Repeated transmission has occurred, nevertheless, to chickens and to guinea pigs by *Culex tarsalis* fed on a blood-virus suspension. This occurred after an incubation period of 15 days till the end of the experiments at 30 days. Incubation temperatures were again between 78° and 90° F. In one experiment using a duck as the source of infection, these mosquitoes after 10 to 18 days' incubation transmitted the virus to chickens. Infection has also occurred from *C. tarsalis* fed on guinea pigs in the classical way, with transmission to chickens after 17 and 19 days.

cone-nosed bug, especially during the inter-epidemic periods.

DISCUSSION

Thus, for both the St. Louis virus and the western equine virus the cycle suspected in nature has been reproduced. Since both the fowls and the mosquitoes used are present in large numbers in the epidemic area investigated, and have been demonstrated to be naturally infected, it seems reasonable to conclude that this cycle is a normal and an important one. Man, in contrast to the enormous number of other animals suffering from inapparent infection, appears to be an accidental host.

Caution in generalization is advised

TABLE 1

Experiment No. 17

Transmission of St. Louis Encephalitis Virus by Culex tarsalis. Source of Mosquito Infection: Chick No. 70 inoculated subcutaneously 48 hours previously.

Number of Mosquitoes Feeding on Chick No. 70: 53 Holding Temperature: 78°–86° F.

Days After First Feeding	*Number Fed*	*Experimental Animal*	*Test for Virus at 48 Hours*[1]	*Neutralization Test at 15 Days*
6	10	Chick 72	negative	weakly positive
8	13	" 74	positive	positive
10	14	" 84	positive	positive
12	8	" 85	positive	positive
14	13	" 88	positive	positive
16	9	" 93	positive	negative

[1] Chicken bled 48 hours after mosquitoes fed and serum tested for presence of virus as indication of transmission.

Among the mosquitoes it was previously considered possible for only *Aedes* to transmit the western equine virus. In addition to demonstrating the vector rôle of a *Culex* we have recently effected transmission of this virus by *Theobaldia incidens* (Thomson). These had been infected by feeding on a blood-virus suspension. Thus, both the *genus Culex* and the *genus Theobaldia* in addition to *Aedes* must be considered as potential vectors for this equine virus. We must also consider the possible rôle played by the tick and the *at this point*. Conditions in Yakima—a hot, irrigated, agriculturalized valley region—*may not* and *probably do not* represent conditions in some other places, as some of our studies in Texas seem to indicate.[31] There may be numerous other vectors and of animal hosts suited to their feeding habits.

It now seems very probable that *Culex pipiens* was the important vector during the great St. Louis outbreak. It, too, is a domestic mosquito, feeding frequently on birds. Dr. Lumsden tells us that the distribution of human cases

in the county and the periphery of the city fits satisfactorily with the distribution of a domestic fowl reservoir. *Culex pipiens* and *Culex quinquefasciatus* (Say) were the predominant mosquitoes during the time of the outbreak. Since we have failed repeatedly to effect transmission by *Culex quinquefasciatus* it seems less likely to have been involved.

Because it now appears that the St. Louis virus and the western equine virus (and probably the eastern equine virus) are arthropod-borne we would like to suggest an epidemiological classification for this group of encephalitides—"the arthropod-borne virus encephalitides." This would include in addition to those recognized in this country, the Japanese B encephalitis (mosquito-borne) and the Russian spring-summer encephalitis (tick-borne). This would obviate the confusion now encountered in the use of the terms "epidemic encephalitis" and "infectious encephalitis," terms which do not exclude the von Economo type, rabies, African trypanosomiasis, and others. These other terms seem to serve no useful purpose.

In regard to control, mosquito abatement is possible, as has been repeatedly demonstrated.[47] The degree of control depends on local conditions, species breeding habits, the intelligence with which a control program is planned and carried out, and on the administrative and financial action taken.

Mosquito bite protection is an individual's responsibility, and even in the presence of severe odds much can be accomplished by means of regulation of working hours, clothing, screening, and the use of insect repellents.

Vaccination for the western equine infection, now tested on a large scale in man, appears to be practical. When and where vaccination is indicated is still a problem to be faced. It is one of definite importance to military personnel in some areas. It seems probable that a vaccine for the St. Louis virus will eventually be available, but we must depend at present on mosquito control or individual mosquito protection.

SUMMARY AND CONCLUSIONS

Field and laboratory investigations furnished data which gave rise to the hypothesis that in at least one epidemic area both St. Louis and western equine encephalitis were mosquito-borne, and that the source of mosquito infection was a huge inapparent reservoir among vertebrates, particularly domestic fowl. Since both viruses had been found in naturally infected *Culex tarsalis*, this species of mosquito was tested in the laboratory for its ability to acquire infection from fowl, and in turn to transmit it. This reproduction in the laboratory of the suspected natural cycle was effected for both viruses. It appears, therefore, that both types of encephalitis are mosquito-borne and that there probably exists an inapparent animal reservoir. However, other mosquitoes representing three *genera* and other arthropods are capable of transmitting the infection in the laboratory. In some areas these might serve as vectors, and in this case other vertebrate hosts might be involved as reservoirs. Control apparently should be directed primarily at the arthropod vectors, with human vaccination employed under special circumstances.

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Public Health Problems Concerned in the Disposal of Garbage by Feeding It to Swine*

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THE disposal of garbage has been one of the most difficult of the many sanitary problems faced by municipal administrative officials. The incineration of this material requires a considerable capital investment, reduction has not proved to be a profitable undertaking in most municipalities, and many are not in a position to employ the sanitary fill to advantage. Consequently, a large percentage of American cities have found it necessary to utilize the hog feeding method of disposal.

During the first World War, considerable pressure was brought to bear to increase the feeding of garbage to hogs as a food conservation measure. Already similar efforts are being made in connection with the present emergency. While such efforts are entirely in order and will probably be continued of necessity, it is believed that the public health feature of such a program should not be ignored. For the past several years, the writer has had occasion to study various aspects of this problem and has been called upon from time to time to supply information regarding it to sanitary engineers and other health officials. It now seems worth while to summarize for members of the public health profession and other interested individuals some of the accumulated data.

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RELATION OF GARBAGE FEEDING TO HUMAN HEALTH

Unfortunately the practice of feeding uncooked garbage to swine helps to perpetuate one of the most important parasitic diseases of man in the United States. This disease, trichinosis, is more prevalent in this country than anywhere else in the world, and its occurrence is associated to a considerable extent with the above mentioned practice.

During the past five years, studies have been conducted in the National Institute of Health to determine the distribution of the trichina parasite in different population groups. In these studies, diaphragms have been obtained from persons coming to necropsy in 168 hospitals in 37 states, the District of Columbia, and Puerto Rico. To date, material from 5,379 individuals has been examined, of which 15.9 per cent has been positive for the parasite. Many of the positive cases have represented infections with relatively small numbers of larvae and it is probable that some of the individuals involved never suffered any serious effects from their infection. However, a certain percentage had infections of a degree which would probably cause illness, even though such illness might not have been recognized as trichinosis at the time of its occurrence.

On an average, about 400 clinical cases of trichinosis are reported yearly

to the U. S. Public Health Service. However, about one-third of the states do not require the reporting of the disease and in many others it would appear that the reporting is very casual. Each year there come to the attention of the writer in various ways scores of cases which are not reported to state boards of health. There is good evidence also that many cases of the disease are not properly diagnosed. It is apparent, therefore, that the number of cases of trichinosis on record is in no way representative of the total number which probably occur.

SOURCES OF TRICHINA INFECTION

The trichina parasite, *Trichinella spiralis,* is a small roundworm living as an adult in the small intestine, and sometimes in the large intestine, and as a larva or intermediate form in the voluntary muscles of the same individual. It is found in many carnivorous and omnivorous animals. Most human cases of trichinosis are contracted through the consumption of raw or undercooked pork.

Muscle tissue containing the infective larvae of the parasite is not only infectious for man but is capable also of transmitting infection to swine. As collected, household, hotel, and restaurant garbage usually contains scraps of pork. If this pork carries the live worms, its consumption by swine will result in infection with trichinae. If the scraps happen to have come from a piece of pork which was thoroughly cooked, there is little danger of the transmission of the parasite. However, not all pork scraps recoverable from garbage have been cooked and those which have been cooked may not have had treatment sufficient to destroy the larvae. In a large eastern city, examination of nearly 600 composite 100 gram samples of pork scraps from household garbage revealed trichina infection in 1.5 per cent of the samples. Even though one-third of the positive samples had been cooked, they contained trichinae which were still alive.

The incidence of the trichina parasite in swine is correlated closely with the type of food on which the animals are maintained and with methods of husbandry. Very extensive surveys have been carried out by the U. S. Bureau of Animal Industry to ascertain the extent of infection in swine. Results of these surveys have been reported yearly first by Hall and then by Schwartz in the annual reports of the chief of that bureau. A summation of the data in these reports indicates that there have been examined through June 30, 1941, approximately 12,000 hogs fed on raw garbage, of which 6.2 per cent were infected, approximately 22,000 so-called grain fed hogs, of which 0.8 per cent were infected, and approximately 2,800 hogs fed on cooked garbage, of which 0.4 per cent were infected. In studies in California[1] in which the hogs examined were traced back to the farm and the type of feed ascertained, infection was found in 6.4 per cent of 1,701 hogs fed on raw garbage, in 0.6 per cent of 1,109 hogs fed on grain plus kitchen scraps, and in 0.4 per cent of 2,436 hogs fed exclusively on grain. These data, and many others which are available, indicate beyond doubt that swine maintained on raw garbage are more frequently and more heavily infected with trichinae than are those given most other kinds of feed. They also indicate that the rat plays only a minor rôle in the transmission of trichinosis to swine for the reason that rats are usually just as prevalent around plants feeding cooked garbage as around those feeding raw garbage. If the rat represented the principal source of transmission of the parasite, one would expect almost as high an incidence in hogs fed on cooked as in those maintained on raw garbage.

EXTENT OF PRACTICE OF GARBAGE FEEDING

It is difficult to secure reliable information concerning the number of persons in the United States feeding garbage to hogs, the number of swine maintained on such feed, and the total tonnage of garbage which is disposed of in this manner. In a survey conducted early in 1940 by the Bureau of Agricultural Economics of the U. S. Department of Agriculture through county agricultural agents,[2] replies which were received from the majority of the states indicated that the number of feeders annually feeding 100 head or more totaled 2,786. A total of 1,022,000 garbage fed hogs was reported to have been marketed annually by these feeders. The report stated that, if allowance is made for missing data, the total number of garbage fed hogs in the country runs to more than 1,250,000 per year. This would seem to be a very conservative figure since it gives no consideration to hogs produced by the very large number of persons who market less than 100 garbage fed hogs per year.

Early in 1939, the writer[3] conducted a survey of municipal garbage disposal methods through questionnaires forwarded to health officers in all cities of 10,000 population and over. Replies were received from 764, or 79.3 per cent, of 964 such cities. These replies indicated that a total of 296 cities disposed of municipal garbage entirely by feeding it to swine, while an additional 107 cities disposed of part of the garbage in this manner. Thus a total of 403, or 52.7 per cent, of the 764 cities replying to the questionnaire disposed of municipally collected garbage in whole or in part by feeding to swine. In only 24 of the 403 cities was the garbage cooked before its consumption by swine. While figures are not available for the country as a whole, it is reasonable to assume that the practice is equally or more extensively prevalent among smaller cities and towns.

Available data indicate that the trichinosis morbidity rate is correlated closely with the practice of feeding uncooked garbage to swine. For instance, the Pacific Coast States, which rank second in the number of the cities disposing of garbage by feeding it to swine, have the highest morbidity rate of any section. The New England States, with the next highest morbidity rate, lead all other geographical areas in the number of cities using the hog feeding method of disposal.

VALUE OF GARBAGE AS A HOG FEED

The food value of garbage varies considerably according to the source of the material. Garbage from hotels and restaurants, as well as hospitals and other institutions, has a much greater food value than has material from private homes. The food value of garbage has decreased considerably during the past 10 to 15 years. Formerly a ton of garbage would produce approximately 50 to 60 lbs. of pork but more recently this value has been decreased to 30 to 40 lbs. For instance, the fattening value for hogs of Los Angeles city garbage has decreased from 68 lbs. per ton in 1932 to 31 lbs. per ton in 1939. The beginning of the depression period in 1930 marked a considerable fall in the food value of garbage, a decrease which was probably due to economies effected by the housewife. However, the value has continuously declined and it is probable that other factors, such as wider use of mechanical refrigeration in the home and the increased consumption of canned food, have had considerable influence. Whatever the factors may be, the continued decline in the food value of garbage has resulted in decreasing considerably the margin of profit for the hog feeder and has rendered the business of garbage feeding even more hazardous financially.

In general, garbage fed hogs are not

popular with the meat packers because garbage produces a soft, oily pork. The dressed carcass yield of garbage fed hogs is less, and cured pork and lard from such hogs are inferior in quality to that obtained from grain fed hogs. A considerable number of packers have indicated that condemnations are more frequent in the case of garbage fed hogs. These facts and that of buyer discrimination make it necessary to sell this type of pork at a reduced price. Consequently, most meat packers buy garbage fed hogs only at a discount; this discount averages between $.50 and $1.00 per 100 lbs.

COST OF GARBAGE IN RELATION TO RETURNS

The decreasing food value of garbage, packer discrimination, and price discounts are of direct concern to the garbage feeder. Unless he is able to secure quality garbage gratis or at a low figure, he is operating under distinct handicaps which at best allow only a slight margin of profit. Many hog feeders secure garbage gratis while others pay varying prices for both household and hotel and restaurant garbage. In a few places the city pays the hog feeder for the collection and disposal of the garbage. Practices in regard to charging for this refuse material vary considerably and depend somewhat on the quality or food value of the material. In some places a fixed price is asked while in other cities the cost is in relation to the market price of corn. For instance, in St. Louis, where the city sells a considerable quantity of municipally collected garbage to hog feeders, the price has ranged from $.60 to $1.20 per ton, depending on the price of corn. In Portland, Ore., the competition among garbage feeders for good quality garbage has resulted in prices as high as $6.00 per ton. Obviously, the higher the price paid for the garbage, the fewer opportunities for profit there are for the feeder.

DISEASES ENCOUNTERED IN GARBAGE FED HOGS

Diseases other than trichinosis are transmitted through garbage, and the frequent occurrence of these diseases contributes to the financial hazards involved in the feeding of raw garbage to hogs. Among these diseases are hog cholera, swine erysipelas, foot and mouth disease, tuberculosis, vesicular stomatitis, and vesicular exanthema. Hog cholera is a particular scourge of garbage fed swine and many outbreaks are due to the transmission of the virus in scraps of pork in the garbage. In fact, Canada requires the cooking of garbage before its consumption by swine as a means of controlling this disease. Vesicular exanthema first appeared in garbage fed hogs in California in 1932; since that time it has occurred intermittently, each time in increasing scope, until it has become a formidable problem because of extensive monetary losses resulting from the high mortality in young pigs.

COOKING OF GARBAGE AS A MEANS OF DISEASE PREVENTION

The heat treatment of garbage in a manner sufficient to destroy viruses, bacteria, or worm larvae contained in parts thereof would seem to offer a solution to the control of many of the diseases transmitted by this material. Consequently, the cooking of garbage offers distinct advantages to the feeder.

The cooking of garbage before its consumption by swine would not completely solve the trichinosis problem because other factors enter into the transmission of the disease. However, because garbage fed hogs are on the average more frequently infected and more heavily infected with trichinae than are those maintained on most other kinds of food, the method would contribute to a considerable extent to the control of human trichinosis.

The frequent warning of the public to cook pork well has apparently been

unsuccessful in controlling this disease, since there is no evidence to indicate a reduction in the number of clinical cases over the period in which intermittent warnings have been given. The present situation warrants the application of control procedures other than a dependence on the individual to protect himself against the disease, since public health practices are far beyond the antiquated stage wherein personal responsibility is the sole guide to disease prevention.

As previously stated, Canada requires the cooking of garbage as a measure of protection against hog cholera. In England cooking regulations are in force as a means of preventing foot and mouth disease. There have been few outbreaks of human trichinosis in Canada and, until the past year, England has been particularly free of the disease. According to one authority, the occurrence of a relatively large number of cases in England recently has been associated with a wartime relaxation in the enforcement of the regulations. In the United States, Oregon and Kentucky have regulations pertaining to the cooking of garbage before its consumption by swine. In Oregon, the regulations are administered by the State Department of Agriculture, and in Kentucky by the State Department of Health. Legislation to this end has recently been enacted in New York State. A rather exhaustive inquiry into the situation in that state was made by the New York State Trichinosis Commission.[4-5] Following the work of the commission, several pieces of legislation having a bearing on trichinosis control were enacted. These included a measure to regulate slaughter-houses, a provision for the processing for the destruction of trichinae of pork products customarily eaten without cooking by the consumer, and a bill requiring that any contract made or permit issued by a municipal corporation or any public or private institution for the disposal of garbage shall require proper cooking of the material before it is used as a feed for swine.

Contacts with state officials and a personal survey of the situation in the two first mentioned states have led the writer to believe that little opposition has been encountered in the enforcement of the regulations and that for the most part garbage feeders have voluntarily complied with the requirements and are not dissatisfied with them. In interviews with feeders in these states, they have raised none of the objections commonly offered by individuals who have never tried the feeding of cooked garbage.

OBJECTIONS TO COOKING GARBAGE FOR HOGS

The objections to feeding cooked garbage generally come under five categories, viz.: lack of palatability, presence of injurious acids and alkalies, toxicity of citrus rinds, absence of free choice selection of food, and failure of the hogs to make adequate gains. While we have no way of measuring the gustatory preferences of a hog other than its acceptance or rejection of food, the fact that hogs do consume cooked garbage with apparent relish is in itself an answer to the argument that the cooked material lacks palatability. There is also no evidence that the cooking of garbage releases dangerous acids and alkalies not already in available form. Cooking may, however, distribute such substances throughout the material. Unless in strong concentration, the dilution of such substances by the customary addition of a large amount of water to garbage is such as to render them usually innocuous.

A frequently expressed objection to the cooking of garbage has dealt with the supposition that the cooking of citrus fruit rinds releases a poison dangerous to hogs. However, experi-

mental evidence [6] indicates that, although they have very little food value, the cooking of the rinds results in no toxic effects.

More or less free choice selection of food material is offered when hogs are maintained on raw garbage. When the material is cooked, the animal is of course not privileged to separate out types of food not to its liking. This is a valid objection, although the ability of the animal to follow its predilections may not necessarily be correlated directly with the nutritive value of the food selected. In fact, it has been the experience of many feeders that the use of cooked garbage is more economical, since a greater portion of the material is consumed and there is much less waste.

Some feeders have reported in the past that hogs fail to make adequate gains on cooked garbage. Unfortunately most opinions of this sort are based on limited observation and are not supported by evidence from carefully planned and executed experiments in which adequate controls have been employed. However, it is probably true that the prolonged heating of garbage at high temperatures does break down or destroy some of the nutritive elements in the material. Little is known concerning the changes brought about in garbage heated to various temperatures and under various conditions, and more experimental work is needed on this problem. In spite of the lack of knowledge on the subject, there may be offered as evidence the opinion of many of those who have fed cooked garbage to swine and who believe that advantages are to be derived from cooking the material. A majority of the feeders interviewed by the writer stated that hogs maintained on cooked garbage averaged 1 to 1½ lbs. gain per day, which is certainly a good rate of gain. Some of these individuals fed grain supplements in addition to

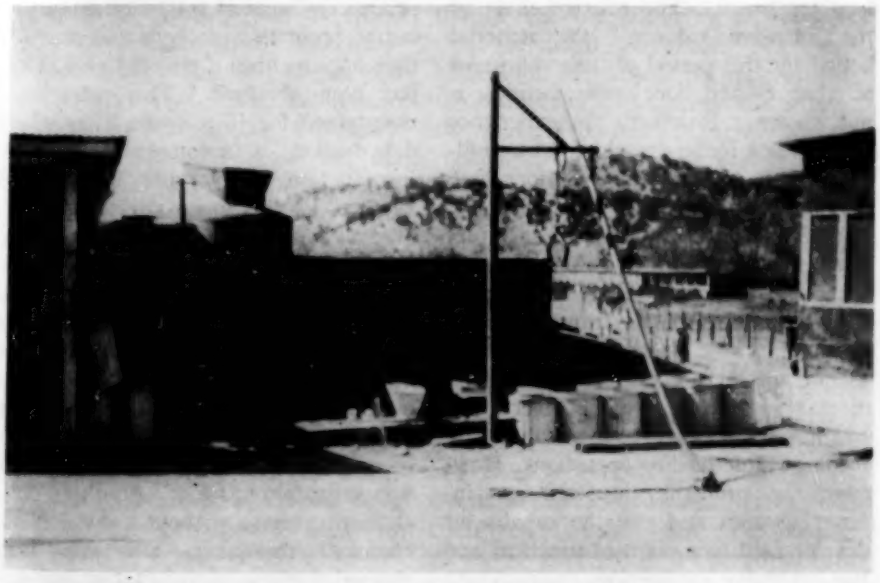

FIGURE 1—Second-hand rendering tank used for the steam cooking of garbage at the U. S. Marine Hospital, Fort Stanton, N. M.

garbage but some fed only cooked garbage.

METHODS OF PROCESSING GARBAGE

Garbage can be processed in various ways as a means of preventing disease transmission. The most practical treatment consists in boiling the material after the addition of water. This is probably the simplest and most inexpensive method of heat treatment available. In small operations, it can be accomplished by the use of equipment usually at hand or easily and inexpensively devised (Figure 1). In large scale feeding operations, equipment for boiling has not been difficult to provide and usually costs less than that needed for heat treatment by other methods. The suggested sanitation code of the U. S. Public Health Service specifies the holding of garbage to a boiling point for at least 30 minutes as a means of preventing the transmission of trichinosis. It would appear also that the transmission of many swine diseases could be obviated by this amount of heat treatment. The relative effect of the nutritive value of the material boiled for this period of time compared to that cooked for longer periods is not known. However, the experience of some hog feeders would seem to indicate that garbage boiled for long periods has less feeding value.

Various other methods have been devised for the treatment of garbage so that it may be used as a food for swine without danger of the transmission of disease. These methods involve the use of special processes which require more or less elaborate machinery and which would probably be suitable only for large scale feeding operations. However, the principles involved are interesting ones and may be capable of development to a point of practical and less expensive application.

One of these processes consists of a revolving cylinder provided between the outer surface and the inner container with a steel jacket through which superheated air is blown by forced draft. The amount of heat applied to the garbage is controlled through escape of vapor, through the constant rotation and agitation of the material, and through the regulation of its depth over areas of varying temperature. It is possible by this process to decrease materially the moisture content of the garbage. The estimated cost of dehydrating garbage by this process varies between $2.75 and $3.25 per ton, depending on the scale of operation. This figure includes no allowance for labor, insurance, or interest on the money invested.

Another process which has been recommended for the dehydration of garbage and its conversion into a feed for livestock consists of a cylindrical dryer with a steam jacket surrounding the internal chamber containing the material (Figure 2). Paddles within the chamber provide a constant agitation of the material during the heating process. Chemical treatment is carried out to promote hydrolysis and steam is then applied until a pressure of 100 lbs. has been obtained. This pressure is maintained for 10 minutes, after which dehydration is accomplished by the introduction of varying amounts of vacuum in the inner chamber and a gradual lowering of the steam pressure in the outer chamber. The process is so arranged that suitable proportions of grain can be introduced through a special vacuum valve arrangement to be mixed with the garbage and provide a balanced ration. It has been estimated that the cost of treating a ton of garbage by this method amounts to approximately $1.65. Another quite similar process, without provision for chemical treatment, has also been devised.

Of the several methods of processing garbage, experiments carried out at

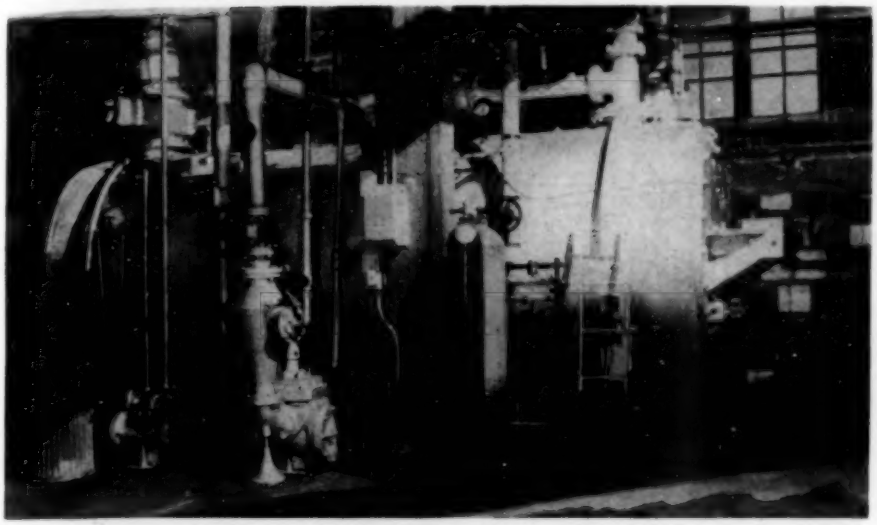

FIGURE 2—Apparatus employed for the steam-vacuum dehydration of garbage and its conversion into a feed for livestock

Courtesy American Process Feed Co., San Diego, Calif.

the California Agricultural Experiment Station under the direction of Prof. E. H. Hughes indicated that the simple heat treatment of garbage by the introduction of steam to an open container was most satisfactory from the standpoint of the food value of the product. Hogs maintained on garbage cooked in this way made better gains than did those fed the dehydrated material. Furthermore, in the feeding trials there was very little difference between the average daily gain of hogs fed on the open steam cooked garbage and raw garbage collected from the same source.

The above mentioned experiments, which are as yet unpublished, confirm the impression of the writer gathered as a result of visits to numerous garbage feeding plants and of interviews with individuals who have been feeding cooked garbage to hogs, in some cases over a long period of years. On a recent tour of such plants in a state in which there were promulgated two years ago regulations requiring the cooking of garbage before its consumption by swine, all feeders interviewed stated that they would not return to the feeding of uncooked garbage even though the regulations were revoked. One individual who cooks and feeds 42,000 lbs. of garbage per day without the addition of any supplements advised the writer that the superiority of cooked garbage over raw garbage is so great that he considers the authorities did him a great favor in requiring him to cook the product. He stated that the cost of cooking would be more than compensated for by the extra feeding value of the cooked garbage, even though the grease salvaged from the cooked material more than covered the cost of operation. Losses had also been reduced materially since the product had been cooked. Another prominent livestock producer, who had threatened court action rather than cook garbage for hogs, later thanked the authorities for enforcing regulations and stated that he would never revert to the feeding of the raw material.

FIGURE 3—Boiler and one of the cooking tanks employed for the steam cooking of garbage for 300 hogs

COST OF EQUIPMENT FOR PROCESSING GARBAGE

The expense of installing equipment for the heat treatment of garbage varies considerably in accordance with the method of cooking, the number of hogs to be fed, the simplicity or elaborateness of the equipment, the type of fuel to be employed, and other factors. For instance, some feeders use oil burning equipment or automatic stokers which represent greater initial capital outlays but which probably pay for themselves in the long run in the saving of wages. The outlay for equipment used in the special processes mentioned above would run into thousands of dollars and would be warranted only for large scale operations. For open kettle steam cooking or direct open flame cooking, elaborate or costly equipment is not necessary and most feeders improvise equipment from discarded or second-hand materials. In order to give some practical idea as to the cost of cooking equipment, the following is summarized from information obtained from representative feeders at the time of inspection of their operations.

F. P. On an average feeds 100 hogs; supplements garbage with grain. Collects and cooks approximately 3,750 lbs. of garbage per day. A 15 h.p. boiler and automatic stoker cost $500 four years ago. A 500 gal. steel cooking tank cost $20 second-hand. This is a closed tank and the garbage is cooked under steam pressure. This individual has been feeding cooked garbage for 31 years.

C. E. Maintains about 300 hogs on an average. Collects and cooks about 4,000 lbs. of garbage per day. Uses a 20 h.p. boiler (Figure 3) which cost $400 new, and 2 steel cooking tanks which cost $50 each new. A single steam line is run across the bottom of each tank. Each cooking tank holds 340 gal. Supplements cooked garbage with grain.

H. B. Maintains on an average about 200 hogs. Collects and cooks 4,500 lbs. of garbage per day. Pays $1,000 per year for garbage. Uses a 10 h.p. tubular boiler which cost $300, and an 800 gal. steel cooking tank which cost $69.50. Steam lines are run across bottom of tank. Supplements cooked garbage with distillery waste.

B. B. Feeds on an average of 1,500 hogs. Cooked garbage is supplemented with an average of 1.5 lbs. of grain per head per day. Collects and cooks approximately 11,000 lbs. of garbage per day. The equipment consists of a 20 h.p. boiler, 2 steel cooking vats, one of 2,800 gal. and the other of 1,260 gal. capacity, and a grease vat holding 360 gal. This equipment, together with necessary feed troughs and chutes for delivering garbage cost $1,575 installed.

B. and N. Feed an average of 2,000 hogs on cooked garbage only. Collect and cook about 21 tons of garbage per day. Equipment (Figure 4) consists of a 42 h.p. high pressure boiler, 2 steel cooking vats, one of 2,880 gal. capacity and the other of 2,231 gal. capacity, a cooling vat holding 1,260 gal., a grease vat holding 619 gal., and a storage and cooling vat holding 2,430 gal. This equipment, including necessary chutes and feeding troughs, cost $3,278 installed.

C. J. Maintains about 12 hogs on an average. Cooks in two 50 gal. (Figure 5) oil drums, each set in a brick furnace. The oil drums and brick for the furnace were salvaged from the city dump and represent no cash outlay. Fuel consists of packing boxes and crates salvaged from the dump.

D. B. Feeds on an average of 500 hogs; supplements cooked garbage with grain approximately 2 lbs. per day per hog. Cooks and feeds 4,000 lbs. of garbage per day. Uses two 1,000 gal. steel tanks which cost $80 each. Steam lines are run across bottom of tanks. Boiler cost $600.

G. B. Maintains about 800 hogs on an average. Cooking equipment consists of two 2,550 gal. Douglas fir cooking vats which cost $70 each. A marine boiler and piping cost $500. The steam pipes are placed over the bottom and around the sides of the tanks. Supplements cooked garbage with grain at rate of 1.5 lbs. per hog per day.

Most of these observations were made and recorded prior to our active participation in the war. The situation in regard to the availability of equipment for the treatment of garbage has changed materially and it is not possible to predict whether materials will be obtainable for this purpose. No doubt the advantages of the practice from a public health standpoint will have to be weighed against the neces-

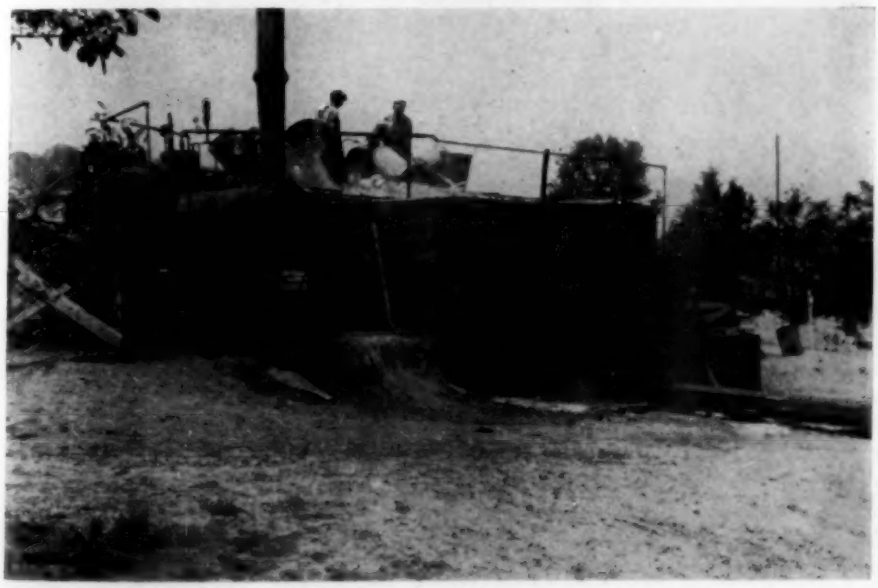

FIGURE 4—Apparatus used for the steam cooking of garbage for 2,000 hogs

sity for conserving metals for war purposes. The matter has been placed tentatively before the War Production Board and sooner or later a policy will be formulated. However, no change in the situation has taken place in other war countries, and regulations covering the cooking of garbage are still in force in Canada and England.

COST OF OPERATION

Accurate figures on the cost of cooking garbage are very difficult to obtain for the reason that most feeders do not maintain bookkeeping systems and can only estimate costs. Effort has been made by the writer to ascertain from all feeders interviewed some idea as to the cost of operating cooking equipment. The estimates furnished vary considerably, depending on the method of cooking, the section of the country, local wage scales, cost of fuel, manner of handling, and the extent to which inedible material is removed by hand sorting either before or after cooking. Furthermore, in some of the places visited, some of the labor was furnished by the family of the feeder, in which event it was not taken into consideration in estimating costs.

Figures obtained by the writer indicate that the cost of cooking garbage varies from $1.45 to $3.50 per ton on the West Coast and from $.40 to $1.95 per ton in the South. These figures represent only the cost of labor and fuel and do not include such items as interest on the investment, depreciation, insurance, etc. In general, the cost decreases somewhat in proportion to the number of hogs fed. Information furnished the writer by Dr. Benjamin Schwartz of the U. S. Bureau of Animal Industry indicates that the cost of cooking in Canada with installations sufficient to cook garbage for 150 hogs is around $.90 per ton.

FIGURE 5—Two 50 gallon oil drums converted for cooking of garbage over an open flame

SANITATION OF GARBAGE FEEDING PLANTS

The general sanitation of garbage feeding plants has some bearing on the transmission of trichinosis as well as of endemic typhus and plague. These plants provide an abundance of food material for rats, and rats are usually prevalent around such plants unless proper construction is employed and suitable measures are taken to limit their spread. While the rat is of only minor importance in the transmission of trichinosis to swine, hogs do occasionally eat rats and may thus acquire trichinosis in this way.

At best the feeding of garbage to hogs creates something of a nuisance and sanitary conditions may become exceedingly bad unless constant effort is made to maintain the premises in good condition. It is best to have hog feeding plants situated in an area reasonably far removed from residential sections and preferably on land which has sufficient fall and enough natural drainage to prevent the accumulation of standing water and mud holes. Sandy soil is more suitable than heavy clay soil.

Feeding platforms should be constructed of concrete with sufficient fall to allow proper drainage into a gutter of a depth sufficient to hold the run-off of waste and wash water. The writer believes that such feeding platforms should be raised above the ground, but in any event each platform should have a rat guard of galvanized iron sheeting or concrete extending 18 in. into the subsoil. Edges of feeding platforms should extend upward at least 6 in. in order to avoid spilling garbage onto the surrounding ground area. Feeding and watering troughs should be likewise constructed of concrete with a surrounding width of concrete platform with gutters to prevent spilling. Bins for bones, tin cans, bottles and other objects salvaged from the garbage should be constructed at least 2 ft. above ground and properly rat proofed. Bones removed from cooked garbage provide less of a nuisance than those in raw garbage. After the meat has been cooked from the bones, they bleach rapidly after being binned and usually cause no odor or fly problem.

Feeding platforms and troughs should be cleaned and washed down at least once a day and all inedible materials removed in order to maintain cleanliness and minimize fly breeding. Large scale operations should only be permitted to be carried on where the owner has sufficient land that feed lots can be changed frequently so that old lots can be turned over and if possible seeded to cover crops.

The garbage feeding plant is a focus for the potential spread of endemic typhus, plague, and trichinosis, and as such warrants supervision by local health departments. A few health jurisdictions have regulations governing the operation of such plants. In Los Angeles County, Calif., the County Live Stock Department maintains close supervision over garbage feeding plants. From the standpoint of promoting rat control and general sanitation, construction plans issued by this department are the best the writer has seen.

SUMMARY

It is pointed out that the widely prevailing practice of disposing of garbage by feeding it to swine provides an important avenue of infection for human trichinosis and a potential hazard for the spread of endemic typhus and plague. The cooking of garbage before its consumption by swine constitutes an important step in the control of human trichinosis. Objections on the part of hog feeders to this practice are discussed and evidence is offered to indicate that many feeders who now cook garbage find it feasible and economical to do so. Information is given on

methods of processing garbage and types of equipment now in use in various places. Data obtained from hog feeders on cost and operation of equipment is furnished for the benefit of sanitary engineers and others who may have occasion to deal with this problem.

NOTE: Information contained in this paper has been obtained from a wide variety of sources and the writer is indebted to those persons who have coöperated in furnishing it. Particularly is he grateful for the assistance accorded by the following individuals and organizations: Dr. A. T. McCormack, Kentucky State Health Commissioner; Mrs. Sarah Vance Dugan, Director, Bureau of Foods, Drugs, and Hotels, Kentucky State Department of Health; Dr. C. H. Blandford, Hardin County Health Officer, Elizabethtown, Ky.; M. M. Warren, Jefferson County Board of Health, Louisville, Ky.; R. E. Boyle, Manager, Fontana Farms, Fontana, Calif.; Professor E. H. Hughes, University of California, College of Agriculture, Davis, Calif.; W. E. Upshaw and E. H. Jefferson, Oregon State Department of Agriculture, Portland, Ore.; the Institute of American Meat Packers, Chicago, Ill.; and J. M. Princell and Lawrence Oliver, American Process Feed Co., San Diego, Calif.

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Age and Sex as Factors in the Development of the Typhoid Carrier State, and a Method for Estimating Carrier Prevalence*

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As a result of improvements in environmental sanitation, chronic typhoid carriers have assumed greater relative importance as sources of infection. Changes in typhoid incidence will probably bear a direct relationship to the prevalence of typhoid carriers, so it is of interest to estimate the current and future prevalence of these carriers. Age and sex are believed to be factors of importance in the pathogenesis of the carrier state and will be treated in this paper.

A. CHRONIC CARRIERS

Klinger [1] noted marked differences in the age distribution of what he defined as temporary and chronic carriers. The temporary carriers were predominantly children, the curve of carriers by age paralleling the curve of typhoid cases by age. Chronic carriers were rarely found among children; they were most frequently found among middle-aged adults. Stokes and Clarke,[2] Dean,[3] Lentz,[4] and Ledingham and Arkwright [5] also pointed out the marked preponderance of adults, particularly adult females, among chronic carriers. Möller [6] studied 64 chronic carriers among 7,125 recovered cases, noting that 45 were adult females, 16 were adult males, and only 3 were children. The rate of development of the carrier state in the childhood group was 0.1 per cent as contrasted with 13.5 per cent among adults. Hedrich [7] analyzed the records of approximately 10,000 recovered cases of typhoid fever occurring in New York City between 1916 and 1926. One hundred and seventy-five of these persons had positive stools six months or longer after recovery. The observed rate of development of the carrier state among females was more than twice that among males. Moreover, the probability of developing the carrier state increased sharply with age, being about ten times as high at age 50 as at age 20.

On the other hand, Havens and Dehler [8] attempted to determine whether typhoid carrier genesis varied with age or sex and decided that there were no differences. Similarly, Bigelow and Anderson,[9] as a result of their studies in Massachusetts, concluded that sex differences disappeared when they

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† Formerly Epidemiologist, New York State Department of Health.

considered only carriers who were derived from convalescent cases.

The records of the New York State Department of Health cover a little more than 10 years' experience relative to fecal release specimens from typhoid fever convalescents. Prior to 1929 release specimens were not required except from individuals regularly engaged in food handling occupations. The Sanitary Code was then amended, effective November 1, 1929, requiring that convalescent typhoid patients submit at least two successive negative specimens of feces before being released from supervision. The specimens must be passed not less than 3 weeks from the date of onset and at an interval of not less than 5 days. Cases among persons regularly engaged in food handling occupations are not released until they submit four successive negative specimens of feces, passed in the manner described. The Code defines a chronic fecal typhoid carrier as one whose feces contain typhoid bacilli, but who does not give a history of typhoid fever within the preceding year. By authority of these two regulations, then, fecal specimens are obtained from all individuals with typhoid fever until the requirements for release are met or until it is determined that the chronic carrier state exists.

Between January 1, 1930, and December 31, 1939, there were 3,750 cases and 433 deaths from typhoid fever reported in New York State, exclusive of New York City and state institutions. This represents a case fatality rate of 11.5 per cent, which indicates that reporting was quite complete. With the exception of 620 cases, all were followed for a sufficient length of time to determine their status according to the foregoing definitions. There were 25 who did not submit a sufficient number of specimens for release because they were not effectively followed up; 142 others who absconded or left New York State before submitting proper release specimens; and 453 who died in the attack of typhoid fever or within 1 year of the illness.

It is generally stated that 2 to 4 per cent of typhoid cases become chronic carriers. Among the 3,130 cases comprising this series, 90, or 2.9 per cent, became chronic carriers.

The rôle played by age in the development of the carrier state is shown in Table 1. Although almost half (48.9 per cent) of the typhoid cases were under 20 years of age, only 5.5 per cent of the carriers resulted from these particular cases. It appears that the probability of becoming a carrier is negligible (0.3 per cent) if typhoid is

TABLE 1

Typhoid Cases and Resulting Chronic Carriers by Age*

New York State, Exclusive of New York City and State Institutions

1930–1939

Age at Time of Typhoid	*Number*		*Per cent of Total*		*Per cent Cases Resulting in Carriers*
	Cases	*Carriers*	*Cases*	*Carriers*	
Under 10	628	2	20.1	2.2	0.3
10–19	902	3	28.8	3.3	0.3
20–29	579	12	18.5	13.3	2.1
30–39	409	18	13.1	20.0	4.4
40–49	295	26	9.4	28.9	8.8
50–59	188	19	6.0	21.1	10.1
60 and over	129	10	4.1	11.1	7.8
All ages	3,130	90	100.0	100.0	2.9

* Includes only those typhoid cases from whom a sufficient number of fecal specimens were obtained to determine carrier status.

contracted while one is less than 20 years of age. This probability increases with advancing age, reaching a maximum of 10.1 per cent among cases in the 50–59 age group.

From Table 2 it will be noted that females make up only 44.3 per cent of the cases, but comprise 58.9 per cent of the carriers. The rate of development of the carrier state at all ages is almost twice as high for females as for males. The most striking sex difference in the age-specific carrier rates occurs in the 40–49 age group in which 16.4 per cent of the female cases and only 3.5 per cent of the male cases resulted in the chronic carrier state.

disease. Cases were entered into the table as of the week in which their first fecal specimen was submitted for examination.

Certain assumptions were necessary because specimens were not submitted from all patients every week. When typhoid bacilli were found in two successive specimens submitted with more than 1 week interval, it was assumed that intervening specimens would also have been positive. Likewise, while realizing the possibility of intermittency of the carrier state, two negative specimens were considered to represent the state of affairs for all weeks between the two negative examinations. When a positive

TABLE 2

Typhoid Cases and Resulting Chronic Carriers by Age and Sex*

New York State, Exclusive of New York City and State Institutions

1930–1939

Age at Time of Typhoid	Number				Per cent of Total				Per cent Cases Resulting in Carriers	
	Cases		Carriers		Cases		Carriers			
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Under 10	347	281	2	..	11.1	9.0	2.2	...	0.6	...
10–19	491	411	2	1	15.7	13.1	2.2	1.1	0.4	0.2
20–29	341	238	7	5	10.9	7.6	7.8	5.6	2.1	2.1
30–39	216	193	6	12	6.9	6.2	6.7	13.3	2.8	6.2
40–49	173	122	6	20	5.5	3.9	6.7	22.2	3.5	16.4
50–59	110	78	10	9	3.5	2.5	11.1	10.0	9.1	11.5
60 and over	65	64	4	6	2.1	2.0	4.4	6.7	6.2	9.4
All ages	1,743	1,387	37	53	55.7	44.3	41.1	58.9	2.1	3.8
Total	3,130		90		100.0		100.0		2.9	

* Includes only those typhoid cases from whom a sufficient number of fecal specimens were obtained to determine carrier status.

B. CONVALESCENT CARRIERS

When these marked age and sex differences among chronic carriers were noted, it was considered desirable to study the relation of these two factors to the average frequency with which typhoid bacilli could be isolated from the feces of convalescent patients. Few such studies are reported in the literature.[3, 9–12] The results of stool cultures for 374 cases reported during 1938 and 1939 were tabulated by sex, broad age groups, and by week after onset of the

was followed a few weeks later by a negative, with no intervening examination, it was assumed that the feces were positive for the first half of the interval and negative for the latter half. The reverse assumption was made when a negative was followed by a positive. No such assumptions were necessary, however, during the first 4 weeks following onset, and in this period the trend of the curve is definitely established.

As seen in Table 3, approximately 61 per cent of the specimens submitted

TABLE 3

Percentage of Typhoid Fever Cases Discharging Typhoid Bacilli in Their Feces by Age and Week After Onset, Based upon 374 Typhoid Cases Reported During 1938–1939 New York State, Exclusive of New York City

Weeks from Onset to Examination	Under 30 Years			30 Years and Over			All Ages		
	Number Cases	Number Positive	Per cent Positive	Number Cases	Number Positive	Per cent Positive	Number Cases	Number Positive	Per cent Positive
Less than 1	40	24	60.0	24	15	62.5	64	39	60.9
1	108	71	65.7	46	35	76.1	154	106	68.8
2	125	80	64.0	64	42	65.6	189	122	64.6
3	159	73	45.9	78	41	52.6	237	114	48.1
4	193	48	24.9	88	38	43.2	281	86	30.6
5	211	34	16.1	105	33	31.4	316	67	21.2
6	222	19	8.6	109	27	24.8	331	46	13.9
7	232	14	6.0	116	25	21.6	348	39	11.2
8	236	12	5.1	119	23	19.3	355	35	9.9
9	237	5	2.1	121	21	17.4	358	26	7.3
10	239	8	3.3	124	19	15.3	363	27	7.4
11	239	4	1.7	127	15	11.8	366	19	5.2
12	243	3	1.2	129	13	10.1	372	16	4.3
13	244	3	1.2	129	13	10.1	373	16	4.3
14	244	3	1.2	130	11	8.5	374	14	3.7
15	244	3	1.2	130	12	9.2	374	15	4.0
16	244	2	0.8	130	11	8.5	374	13	3.5
17	244	2	0.8	130	12	9.2	374	14	3.7
18	244	2	0.8	129	10	7.8	373	12	3.2
19 and over	244	2	0.8	130	10*	7.7†	374	12*	3.2†

* One female, over 30 years of age, became negative in the 42nd week.
† Per cent persons over 30 declared chronic carriers was 6.9; and for all ages, the percentage was 2.9.

during the 1st week of illness showed typhoid bacilli, 69 per cent during the 2nd week, and 65 per cent during the 3rd week. From the 3rd week on there was a rapid decline until an almost constant level was reached at the 20th week.

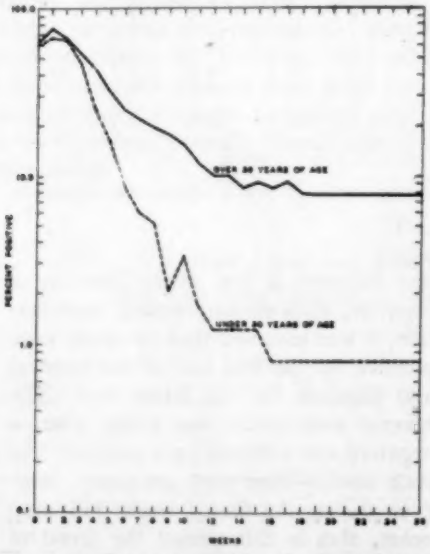

FIGURE 1—Per cent positive fecal specimens by age and week after onset of typhoid fever in New York State exclusive of New York City—374 cases 1938–1939

When the data were analyzed according to sex, differences were observed but they were not statistically significant. The importance of the age factor, however, is striking (Table 3 and Figure 1). At ages 30 and over, 76 per cent of the stools were positive in the 2nd week of the disease, with a decline to 7.7 per cent in the 19th week. At ages under 30 the peak is approximately 66 per cent, also in the 2nd week, followed by a more rapid decline to 0.8 per cent in the 16th week of the disease. Fecal specimens from one female, aged 59, were found to be negative beginning in the 42nd week after the onset of illness.

C. CARRIER PREVALENCE

Estimates of carrier prevalence have recently been made in Massachusetts[13] and Mississippi.[14] In brief, the method employed in Massachusetts was as fol-

lows: The probable number of typhoid cases resulting in recovery was estimated to be equal to nine times the number of reported deaths, and 2 per cent of these survivors were assumed to be chronic carriers; the carrier prevalence in any particular year was represented by those who had become carriers during the preceding 40 years. In Mississippi, the number of persons with a history of having had typhoid fever was determined by means of a field survey of approximately 1 per cent of the population; 3.27 per cent of the persons with a history of typhoid were considered to be chronic carriers. Both methods of estimation admittedly resulted in only rough approximations. The principal deficiency in these methods is that they fail to consider the marked variations in the rates of carrier production among typhoid cases in the several age groups as shown in Table 1. A statistical technic based upon a modified life table procedure is proposed which takes into account the age distribution of carriers resulting from cases, and it may possibly give a more accurate estimate of carrier prevalence than can be obtained with either of the two previously mentioned methods.

In order to apply this method, the following assumptions were made:

1. That a constant relationship has existed during the study period between the number of cases of typhoid fever and the number of deaths from the disease; a case fatality rate of 10 per cent is considered to have been maintained.
2. That the age distribution of recovered typhoid fever cases was the same during past decades as that observed during 1930–1939 (Table 1).
3. That 2.9 per cent of those patients who recover from typhoid fever remain chronic carriers; and that the rate of carrier genesis for each age group was the same in past decades as that observed during 1930–1939. As a corollary of this and the previous assumption, the age distribution of carriers produced in past decades is assumed to be the same as that observed during 1930–1939 (Table 1).
4. That carriers produced during a given decade survive to the beginning of the next decade; and that subsequent to that time they suffer the same age specific mortality risks as the general population.
5. That no carriers have been cured of their carrier condition.

It is believed that errors introduced through these assumptions do not seriously affect the final estimate of carrier

TABLE 4

Number of Typhoid Fever Deaths, Estimated Persons Surviving an Attack of Typhoid Fever and Typhoid Carriers Produced During Each Decade 1860–1939

New York State, Exclusive of New York City

Decade	*Typhoid Deaths*	*Estimated Survivors (col. 2 x 9)*	*Estimated Carriers Produced (col. 3 x 2.9%)*
(1)	(2)	(3)	(4)
1860–69	15,378 *	138,402	4,014
1870–79	13,626 *	122,634	3,556
1880–89	12,288 *	110,592	3,207
1890–99	10,953 *	98,577	2,859
1900–09	9,593	86,337	2,504
1910–19	5,236	47,124	1,367
1920–29	1,713	15,417	447
1930–39	444	3,996	116

* Typhoid deaths for each decade from 1860 to 1899 were estimated on the basis of the following mean annual typhoid death rates:

1860–1869 — 55 per 100,000 population
1870–1879 — 45 per 100,000 population
1880–1889 — 37 per 100,000 population
1890–1899 — 30 per 100,000 population

prevalence in New York State. On the basis of assumptions (2) and (3), the final estimate is believed to be somewhat lowered, whereas assumptions (4) and (5) increase the final estimate.

The number of typhoid fever deaths, the estimate persons recovering from an attack of typhoid fever, and the expected number of carriers produced are shown in Table 4 for each decade since 1860. The first step in the life table procedure was to distribute the carriers according to age group at the time of their attack of typhoid (Table 5). These groups are designated as l_x cohorts.

TABLE 5

Distribution by Age Group of the Estimated Number of Typhoid Carriers Produced During Each Decade (l_x Cohorts)

1860–1939

New York State, Exclusive of New York City

Age Group at Onset of Typhoid Fever	*Per cent Total Carriers*	*Estimated Number Carriers Produced*							
		1860–1869	*1870–1879*	*1880–1889*	*1890–1899*	*1900–1909*	*1910–1919*	*1920–1929*	*1930–1939*
Under 10	2.2	88	78	71	63	56	30	10	3
10–19	3.3	134	118	107	95	83	46	15	4
20–29	13.3	535	474	427	381	234	182	60	15
30–39	20.0	803	711	641	572	501	273	89	23
40–49	28.9	1,160	1,028	927	826	723	395	129	34
50–59	21.1	847	751	677	604	529	289	94	24
60–69	10.0	402	356	321	286	250	137	45	12
70–79	1.1	45	40	36	32	28	15	5	1
All ages	100.0	4,014	3,556	3,207	2,859	2,504	1,367	447	116

If we arbitrarily limit our problem to the determination of the prevalence of carriers under 80 years of age as of January 1, 1940, it becomes unnecessary to follow the life table survivorship of every carrier produced in the past. Hence, of the 4,014 carriers comprising the l_x cohort of 1860–1869, only those carriers who were under 10 years of age on January 1, 1870, are pertinent to our problem since the other carriers from this cohort would necessarily be over 80 years of age on January 1, 1940. If we assume that the carriers in this cohort under 10 years of age were uniformly distributed within the age group and assume that all 88 carriers comprising this sub-cohort survived to January 1, 1870, half of them, or 44 carriers, would still have been under 10 years of age on that date, and 44 carriers would have become 10–19 years of age (Table 6, column L_x for 1870). The latter group of 44 carriers would be over 80 years of age on January 1, 1940, and need not be considered in our further calculations. To determine how many of the 44 carriers under 10 years of age would live to enter the 10–19 age group on January 1, 1880, this number is multiplied by the estimated life table survivorship rate of 0.963.* Thus, it was calculated that 42 of the 44 carriers would have survived (Table 6, column C_x for 1880). The next step was to obtain the L_x cohort as of January 1, 1880. Inasmuch as carriers in this cohort who were over 20 years of age would be over 80 years of age on Janu-

* Life table survivorship rates by age group for 1910–1919, 1920–1929, and 1930–1939 were calculated from abridged life tables for New York State, exclusive of New York City. The life tables were constructed in accordance with the procedure proposed by Reed and Merrill.[18] The survivorship rates obtained for 1910–1919 were used for the decades prior to 1910.

TABLE 6

Computation by a Modified Life Table Procedure of the Probable Number of Typhoid Carriers by Age Group (L_x Cohorts) as of January 1 of Each Decade, 1870–1900

New York State, Exclusive of New York City

Age Group (x)	$l_{\bar{x}}$ (1860–1869)	L_x (1870)	$_{10}p_x$ † (1870–1879)	C_x (1880)	$l_{\bar{x}}$ (1870–1879)	L_x (1880)	$_{10}p_x$ † (1880–1889)
Under 10	88	44	0.963	..	78	39	0.963
10–19	*	(44)*		42	118	140	0.957
20–29	*	*		*	*	(59)*	
30–39	*	*		*	*	*	
40–49	*	*		*	*	*	
50–59	*	*		*	*	*	
60–69	*	*		*	*	*	
70–79	*	*		*	*	*	
Total	88	88		42	196	238	
All ages	4,014				3,556		

Age Group (x)	C_x (1890)	$l_{\bar{x}}$ (1880–1889)	L_x (1890)	$_{10}p_x$ † (1890–1899)	C_x (1900)	$l_{\bar{x}}$ (1890–1899)	L_x (1900)
Under 10	..	71	35	0.963	..	63	31
10–19	38	107	127	0.957	34	95	113
20–29	134	427	401	0.937	122	381	360
30–39	*	*	(214)*		376	572	853
40–49	*	*	*		*	*	(286)*
50–59	*	*	*		*	*	*
60–69	*	*	*		*	*	*
70–79	*	*	*		*	*	*
Total	172	605	777		532	1,111	1,643
All ages		3,207				2,859	

* Carriers are not included who would be over 80 years of age as of January 1, 1940.

† Values of $_{10}p_x$ are assumed to be the same as those calculated for the decade 1910–1919.

$l_{\bar{x}}$ represents a cohort of typhoid carriers produced during a decade according to age groups x at the time of their attack of typhoid.

L_x represents a cohort of typhoid carriers according to age groups x as of January 1 of a given year.

$_{10}p_x$ designates the probability of persons in the general population at age group x surviving to age group $x + 10$.

C_x represents a cohort of typhoid carriers, according to age groups x as of January 1 of a given year, who are the survivors from a preceding L_x cohort.

ary 1, 1940, only the carriers in the two sub-groups under 20 years of age are of interest. These groups were constituted as follows: the 39 carriers comprising the L_x sub-cohort under 10 years of age were derived from half the 78 carriers under 10 years of age produced between 1870 and 1879; the 140 carriers comprising the L_x sub-cohort 10–19 years of age were obtained by the addition of three groups of carriers: 39 were the other half of the 78 carriers under 10 years of age produced between 1870 and 1879; 59 were half of the 118 carriers 10–19 years of age produced between 1870–1879; and 42 were the aforementioned survivors 10–19 years of age.

The procedure described above was continued for successive decades until the L_x cohort for January 1, 1940, was obtained; the detailed computations are shown in Tables 6 and 6-A. Thus, it was estimated that 2,490 typhoid carriers under 80 years of age were living in New York State, exclusive of New York City, on January 1, 1940. The carrier prevalence rate is calculated to be 42 carriers for each 100,000 persons under 80 years of age. While no strict comparisons are justified, it is interesting to note that the carrier prevalence

TABLE 6-A

Computation by a Modified Life Table Procedure of the Probable Number of Typhoid Carriers by Age Group (L_x Cohorts) as of January 1 of Each Decade, 1900–1940

New York State, Exclusive of New York City

Age Group (x)	L_x (1900)	$_{10}p_x$ † (1900–1909)	C_x (1910)	$l_{\bar{x}}$ (1900–1909)	L_x (1910)	$_{10}p_x$ † (1910–1919)	C_x (1920)	$l_{\bar{x}}$ (1910–1919)
Under 10	31	0.963	..	56	28	0.963	..	30
10–19	113	0.957	30	83	99	0.957	27	46
20–29	360	0.937	108	234	267	0.933	95	182
30–39	853	0.920	337	501	704	0.920	249	273
40–49	(286)*		785	723	1,397	0.877	648	395
50–59	*		*	*	(362)*		1,225	289
60–69	*		*	*	*		*	*
70–79	*		*	*	*		*	*
80 and over	*		*	*	*		*	*
Total	1,643		1,260	1,597	2,857		2,244	1,215
All ages				2,504				1,367

Age Group (x)	L_x (1920)	$_{10}p_x$ † (1920–1929)	C_x (1930)	$l_{\bar{x}}$ (1920–1929)	L_x (1930)	$_{10}p_x$ † (1930–1939)	C_x (1940)	$l_{\bar{x}}$ (1930–1939)	L_x (1940)
Under 10	15	0.973	..	10	5	0.984	..	3	1
10–19	65	0.964	15	15	27	0.979	5	4	9
20–29	209	0.947	63	60	101	0.969	26	15	35
30–39	476	0.930	198	89	272	0.948	98	23	117
40–49	982	0.883	443	129	552	0.893	258	34	287
50–59	1,567	0.774	867	94	979	0.780	493	24	522
60–69	(145)*		1,213	45	1,282	0.570	764	12	782
70–79	*		*	*	(23)*		731	1	737
80 and over	*		*	*	*		*	*	(1)*
Total	3,459		2,799	442	3,241		2,375	116	2,491
All ages				447				116	

* Carriers are not included who would be over 80 years of age as of January 1, 1940.
† Values of $_{10}p_x$ for the decade, 1900–1909, are assumed to be the same as those calculated for 1910–1919.
For explanation of symbols, see footnote of Table 6.

rates for Massachusetts and Mississippi in 1935 were estimated to be 48 and 288 per 100,000 population, respectively.

At this point, it should be recalled that one of the basic assumptions made in calculating the New York State carrier prevalence was that 2.9 per cent of patients who recover from typhoid fever remain chronic carriers. It is realized that the true rate of carrier genesis may be higher than 2.9 per cent. The estimate may therefore be considered to be a minimum.

In Table 7 the estimated carriers are shown distributed according to age group and are related to the estimated population and to the number of carriers under supervision as of January 1, 1940. The age-specific carrier prevalence rates are observed to increase with advancing age group. The rate among children under 10 years of age was less than 1 per 100,000, whereas the rate among persons 70–79 years of age was 340 per 100,000. Of the 2,490 estimated carriers 419,* or 17 per cent, were under supervision. This percentage is shown to vary considerably with age. While only 14 per cent of the carriers over 50 years of age were known to the health authorities, the proportion of carriers under 50 years of age who were under supervision averaged 28 per cent.

Further examination of the age dis-

* Nineteen carriers under supervision are excluded who were over 80 years of age on January 1, 1940.

TABLE 7

Estimated Prevalence of Typhoid Carriers and Known Typhoid Carriers Under Supervision According to Certain Age Groups as of January 1, 1940

New York State, Exclusive of New York City

Age Group	Census Population as of April 1, 1940	Estimated Number of Carriers	Carrier Prevalence Rate per 100,000	Number of Carriers under Supervision	Per cent of Estimated Carriers under Supervision
Under 10	826,514	1	0.1	1	100.0
10–19	1,002,712	9	0.9	4	44.4
20–29	992,718	35	3.5	8	22.9
30–39	918,260	117	12.7	28	23.9
40–49	861,065	287	33.3	84	29.3
50–59	678,305	522	77.0	95	18.2
60–69	455,795	782	171.6	119	15.2
70–79	216,584	737	340.3	80	10.9
Total	5,951,953	,490	41.8	419	16.8

TABLE 8

Computation by a Modified Life Table Procedure of the Probable Number of Typhoid Carriers by Age Group (L_x Cohorts) as of January 1 of Each Decade, 1900–1980

New York State, Exclusive of New York City

Age Group (x)	L_x (1940)	$_{10}p_x$ † (1940–1949)	C_x (1950)	$l_{\bar{x}}$ (1940–1949)	L_x (1950)	$_{10}p_x$ † (1950–1959)	C_x (1960)	$l_{\bar{x}}$ (1950–1959)
Under 10	1	0.989	..	2	1	0.989	..	1
10–19	9	0.986	1	3	3	0.986	1	2
20–29	35	0.979	9	11	16	0.979	3	8
30–39	117	0.958	34	16	48	0.958	16	11
40–49	287	0.903	112	23	131	0.903	46	16
50–59	522	0.789	259	17	279	0.789	118	12
60–69	782	0.575	412	8	425	0.575	220	6
70–79	737		450	1	454		244	1
80 and over	*		*		(1)*		*	
Total	2,490		1,277	81	1,358		648	57

Age Group (x)	L_x (1960)	$_{10}p_x$ † (1960–1969)	C_x (1970)	$l_{\bar{x}}$ (1960–1969)	L_x (1970)	$_{10}p_x$ † (1970–1979)	C_x (1980)	$l_{\bar{x}}$ (1970–1979)	L_x (1980)
Under 10	..	0.989	..	1	..	0.989	..	1	..
10–19	3	0.986	..	1	1	0.986	..	1	1
20–29	8	0.979	3	5	6	0.979	1	4	4
30–39	25	0.958	8	8	15	0.958	6	5	10
40–49	60	0.903	24	12	34	0.903	14	8	21
50–59	132	0.789	54	8	64	0.789	31	6	38
60–69	229	0.575	104	4	110	0.575	50	3	54
70–79	247		132	1	134		63	..	65
80 and over	(1)*		*		(1)*		*		
Total	705		325	40	365		165	28	193

* Carriers are not included who would be over 80 years of age.
† Values of $_{10}p_x$ are assumed to be the same as those calculated for 1940.
For explanation of symbols, see footnote of Table 6.

tribution of the estimated carriers shows that 61 per cent were between 60 and 80 years of age. In view of their advanced age, a large number of these carriers may be expected to die annually. Using the proposed life table procedure, the future prevalence of carriers was calculated to January 1, 1980

(Table 8).* Thus, it is estimated that in that year the number of carriers under 80 years of age will have decreased from 2,490 to 193.

CONCLUSIONS

1. The data presented indicate that age and sex are of importance in the development of the typhoid carrier state.

2. Typhoid patients over 30 years of age became chronic carriers nine times as frequently as did younger patients.

3. The rate of development of the carrier state at all ages was 2.1 per cent among male cases, as compared with 3.8 per cent among female cases.

4. Approximately 16 per cent of the females who developed typhoid between ages 40 and 49 became chronic carriers.

5. The rate of bacteriological cure varied inversely with age.

6. A modified life table method was applied to the typhoid experience of New York State, exclusive of New York City, and resulted in an estimated carrier prevalence on January 1, 1940, of approximately 2,500 carriers under 80 years of age, or 42 carriers per 100,000 population.

7. It is highly probable that there will be a rapid decline in carrier prevalence. In 40 years it is estimated that the carrier prevalence will decrease to about 200.

8. Four hundred and nineteen, or 17 per cent, of the estimated carriers in the state were under supervision on January 1, 1940.

NOTE: The authors wish to acknowledge gratefully the advice and assistance of Dr. James E. Perkins during the preparation of the paper.

* The number of carriers produced annually between 1940 and 1949 was estimated as equal to the mean number produced between 1935 and 1939. The estimated number of carriers produced in each subsequent decade was obtained by assuming that the rate of decrease between 1930–1939 and 1940–1949 continued.

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The Use of Vital Records in Military Service—The Navy*

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ANY discussion of the registering of deaths, illnesses, and injuries in the Navy must be prefaced by some little discussion of the principles behind the registration process. The Medical Department of the Navy is charged with the responsibility of seeing that men recruited are physically fit. The physical standards have been long established and all recruits must meet them. After the men have entered the Navy, the Medical Department must care for them. It must see to it that they are ill as little as possible and that injuries are kept to a minimum. In other words, the Navy man must be kept fit to fight at all times. The third responsibility is that of discharging from the naval service those men who are no longer able to perform their duties.

A good system of registration of vital records must have these three responsibilities among its most important considerations. It must measure the worth of the recruiting examinations and quickly pick up those few unfit men who get by medical examiners. It must at all times show a current picture of health conditions throughout the Navy, and it must contain a mechanism which can aid most efficiently in discharging those men who are incapacitated for further duty either because of service conditions or conditions which existed prior to their enlistment.

The vital statistics system must be simple enough to run efficiently in the midst of excitement and upset conditions incident to great naval expansion in time of war. The Navy now has men in such distant places as the Solomon Islands, the Aleutians, the South Atlantic, Iceland, and the cold waters of the North Atlantic on the route to Murmansk. Obviously a top-heavy reporting mechanism could not take care of the recording of morbidity and mortality in such out-of-the-way places of the world within any reasonable period of time. The Navy has expanded from the 150,000 men of 1939 to something over 1,300,000 today, which means that many new doctors and hospital corpsmen are responsible for the efficient basic handling of our morbidity and mortality records, and no long instruction in the handling of these records is possible.

Another fundamental requirement of the Navy's vital statistics system is that it be speedy, for nowadays an epidemic which breaks out in one ship can quickly be passed to another ship and in a short space of time to another port and even to another continent. An epidemic which breaks out in Iceland is a threat to the men of New York just as it is to men in Florida. Finally, of course, our statistics must not sacrifice all detail in order to obtain currency and simplicity.

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To summarize briefly, our statistics must afford some measure of the effectiveness of our recruiting examinations, must give the current picture of health conditions, must indicate the need for medical discharge from the service, and must be as current and simple to administer as possible.

I shall now turn to a description of our reporting system and you may judge for yourself how well it lives up to the requirements which have been outlined. A card, called an " F " card, is made out every time a man is discharged from the sick list of any ship or station in the Navy. Because of the confining nature of naval life and the possibility of whirlwind spread of infectious diseases, admissions to the sick list and consequent isolation are rather frequent. A card is required for every discharge because a card for every admission would leave incomplete information on most cases. The time between admission and discharge from the sick list is usually so short that no great lag is created by counting all discharges rather than all admissions. If a man is admitted to the sick list aboard a destroyer because of a broken leg and then transferred to a hospital ship and finally to a hospital ashore, we will receive three cards—one for his discharge from the destroyer to the hospital ship, one from the hospital ship to the hospital ashore, and finally one from the hospital to duty when he has recovered. This example will boil down to one broken leg in our records but three " F " cards would have been received on the case.

The " F " card is a very simple form and causes comparatively little work aboard ship. It contains such fundamental data as name, race, date and place of birth, length of service, rank or rate, diagnosis, manner of admission and discharge, and the place of admission. Such items as race, date and place of birth aid us in identifying the man (or the woman, now, in the case of the WAVES), while other items such as rank and length of service are of considerable epidemiological importance. The causative agent is an important injury item which is entered on the card.

There are four manners of admission to the sick list, and five manners of disposition. The four manners of admission are first, " new admission "; second, " readmission," for a disease or injury for which the man has already been on the sick list; third, the " EPTE," or an admission for conditions which are considered to have existed prior to entry into the Naval service; and the fourth is an "ACD," or an admission for contributory disability. An example of an "ACD " would be therapeutic poisoning as a complication of the treatment of syphilis. The five manners of disposition or discharge from the sick list are first, the disposition to " Duty "; second, " Change of Diagnosis "; third, "Death"; fourth, " Invaliding from the Service "; and the fifth is " Desertion."

You will have noticed that one of the manners of admission is an " EPTE " or admssion with condition existing prior to enlistment. Such admissions measure the effectiveness of the recruiting examination, but it should be remembered that many conditions cannot be detected in a routine examination, and must await observation under service conditions before they can be discovered. Also, one of the manners of disposition is the " Invaliding from the Service," which is applied to those men who have been found to be unfit for naval service either because they were not fit to enter it or contracted some disease or injury during their service. So much for the reporting system and the " F " card.

Now let us see what uses may be made of the card after it has been received, edited, coded, and punched in the Bureau of Medicine and Surgery in Washington. In addition to the items which I have already listed, every re-

port of new admission for a venereal disease has the "probable place of exposure" noted on it. This has proved of inestimable value to venereal disease control officers, for no longer can a city claim that infected men aboard a ship based there acquired the disease elsewhere. A weekly report is now made of all venereal disease records, tabulating the probable place of exposure, and our venereal disease authorities are afforded valuable data on which to base their efforts.

As the cards are received, and even before they pass the mail desk, they can be scrutinized to see if any unusual occurrence has been reported. Daily reports can be made if necessary from cards received in the mail. This was recently found advisable in the case of jaundice which, as you all know, attracted considerable attention of late. (It was found, incidentally, that the naval service suffered little from jaundice in the past year and a half.) After the cards have been edited, coded, and given a preliminary punching for ease of filing, they are punched on another card for filing by diagnosis while the "F" cards are filed by name.

The diagnosis file becomes a fertile source of data for special studies of all sorts. Comprehensive studies have recently been made of gonorrhea, syphilis, and the more common communicable diseases such as measles, mumps, and chicken pox. The occurrence of these diseases has been investigated in connection with length of service, ship, station, occupation, age, and race. Much light has thus been shed on the problems of prevention of these diseases. For instance, it has been found that mumps, measles, chicken pox, and other diseases of this sort are more frequent in the very first weeks and months of enlistment while venereal diseases are most frequent among men in their third and fourth years of enlistment. Control measures can now be specifically aimed at those groups where the incidence of disease is most severe.

Not long ago while the program for naval expansion was in its infancy the question arose as to whether the policy of earlier years in regard to the temporary quarantine of new recruits should be continued. In the past, recruits have been quarantined for six or eight weeks immediately after their enlistment. One of the officers of the Division of Preventive Medicine had made an excellent study of common communicable diseases and data were at hand from which to form a good judgment as to the course to follow. The data which had been prepared for previous years were quickly brought up to date and presented to the members of a conference called to consider the matter of the planning of training stations. Without the "F" cards or some very close approximations of them, it would have been necessary to have answered on the basis of "hunch" and conviction rather than facts and figures.

The present war has caused attention to be focused on the prevalence of mental diseases. One of the classes of the Diagnostic Nomenclature of the Medical Department of the Navy is called Diseases of the Mind. We have been able to bring together data for the last twenty or more years, and right up to date in this year regarding these conditions. Other studies are now under way on other conditions which I could mention at this time and they are all possible because of the ease and simplicity of the "F" card which has been in use since 1912. Many improvements have been made but the basic theories behind it have not been altered.

Though the "F" card has as one of its manners of disposition "Death," there is an additional form for deaths. It is called "Form N" and it corresponds very closely with the usual death certificates of health departments. In the past, a copy of this death certificate

has been furnished to the Bureau of the Census, insurance companies, next of kin, and other legitimately interested parties. It has been found, however, that the certificate has occasionally contained data which should not be circulated outside the naval service and a substitute form has been devised which is prepared from the death certificate in the Bureau of Medicine and Surgery and sent to the Bureau of the Census and other responsible parties. All information of a secret or confidential nature is deleted from this form.

In addition to the care of naval personnel, the Medical Department is also responsible for the industrial health of the naval establishments where many thousands of civilian employees are working in Navy Yards, Naval Air Stations, and Naval Ammunition Depots. Every accident which occurs among these civilian employees from Panama to Alaska and Maine to California is made a matter of record. Even the minor accidents are recorded because it is felt that minor accidents are indicative of the need of preventive measures. A report is made out on every accident by the dispensary where the injured person is treated, and is sent to the Navy Department where a punch card is prepared.

Periodic studies are made of these accidents: those which are common to certain occupations, the kind of tool which is most dangerous, the previous accident record of the individual, and of the safety devices used or needed. All of this is of the utmost concern—for a day lost making a gun is as important as a day lost firing it.

The Use of Vital Records in Military Service—The Army*

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AS a basis for discussion, it is fitting that you first be informed concerning the kind of vital records used in the Army.

The Army keeps complete records of morbidity and mortality of its soldiers (and less complete records of other personnel), both in peace and in wartime. These records are prepared by the Army medical officers and contract surgeons of each post, camp or station. The reasons for the necessity of keeping complete records of all soldier patients were summarized by Lang [1] and Love [2] as follows:

1. Data are available for the conduct of the business of the War Department and other governmental agencies, with particular reference to the retention of the physically fit in the service, assignments to duty, adjustments to pay accounts and the adjudication of claims for compensation.

2. Diagnostic and therapeutic measures may be evaluated as to their effectiveness.

3. Studies of the nature of diseases may be made.

4. Data may be obtained upon which to base plans for the medical service of the Army in peace and in war. The Army's medical records constitute the most reliable and important source of its military medical experience. These records, says Love, tell the story of the early losses from diseases and non-battle injuries that occur in peace or war and the frequency and fatality of each group. They give in war a detailed account of battle casualties, tell how many occurred on each day, in what units, in what arm or service, the anatomical location and cause of each one, the rapidity of collection and evacuation of the casualties, and the efficiency of treatment as measured by loss of time, resulting disabilities, and deaths.

5. Finally, the records are used to inform members of families concerning their soldier relative's welfare.

What personnel form the basis of the Army's medical reports?

1. Every person admitted to the station hospital, including infants born in the hospital. (Infants born on or near a military station, but not in the hospital of the station, will be reported only when the birth has been attended by a surgeon of the station.)

2. Every person, who, though not admitted to the hospital, is excused from performance of duty because of sickness or injury.

3. Every person on active duty, who, though not excused from duty, is prescribed for or treated or placed under observation with a view of treatment or with a view to discharge on account of disability.

4. Every person on active duty who is retired for disability, discharged for disability or inaptness, or dies.

5. Every person on active duty transferred to another command (i.e., sent to a general hospital from a station hospital) for observation or treatment, and every person whose case is received by transfer or evacuation from a field medical unit.

6. Every person on active duty who departs from the command on sick leave.

7. Every person in active service who is attended by a medical officer or contract surgeon in a civilian hospital.

8. Every person residing at the station or with the command, but not in the hospital, who dies.

What information is recorded for each person for whom a report is made? In peacetime and in the zone of the

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interior (away from the battle zone) in wartime, the information obtained is: name, register number, Army serial number, grade, company, regiment or arm of service, age, race, nativity, years of service, date, source and cause of admission to report, whether or not the admission was in line of duty, change of diagnosis (if any), complications, intercurrent diseases, surgical operations, final disposition of the case with date, name of hospital, and days of treatment.

A report of sick, wounded or injured, and dead is rendered monthly to The Surgeon General from every military station and separate command which is attended by a medical officer. In time of peace and in the zone of the interior (outside the battle area) in time of war, a standard Report Card (Form 52) gives the pertinent information. This card is an exact copy of the Register Card kept by all stationary commands (including hospitals) in peacetime and by stations, general dispensaries, and fixed hospitals in the zone of the interior in wartime.

The Field Medical Record (52 c and d) and the Emergency Medical Tag (52 b) are the forms of reports used in peacetime by moving commands and by troops training in field service. In wartime in the theater of operations, the Emergency Medical Tag is the form of report used by Medical Department organizations (such as medical regiments, battalions, and squadrons) other than hospitals, where the Field Medical Record is employed. These records are attached to the clothing of the patient and travel with him until more definite disposition is made; i.e., return to duty, arrival in the zone of the interior from the theater of operations, or death.

One way in which all three of these records could be used in the case of one casualty is: a man wounded on the battlefield, when found, has attached to his clothing an Emergency Medical Tag. On arrival at an evacuation hospital, the Emergency Medical Tag is removed and made a part of the Field Medical Record which is now created. The patient is then transferred from the evacuation hospital in the theater of operations to a general hospital in the zone of the interior. His Field Medical Record travels with him and forms the basis for making (for the first time in this case) the hospital Register Card, which is the ordinary form of report in peacetime. The Field Medical Record is now closed and forwarded directly to The Surgeon General, as is, in time, the copy of the hospital Register Card called the Report Card.

Thus the Report Card, the Field Medical Record, and the Emergency Medical Tag find their way to the Office of The Surgeon General where they form the basis of The Surgeon General's various reports, but particularly of his Annual Report. After processing (including the making of a punch card for statistical use) by the Office of The Surgeon General, the records are sent to the Office of The Adjutant General and find use as the basis of adjustment of compensation claims.

Each hospital keeps Register Cards and, in addition, the clinical record of each patient, as well as a complete outpatient record. These additional records are available to The Surgeon General for more detailed knowledge of any particular case and are of great use in cases of claims for compensation.

In addition to case reports such as those just described, current statistical reports are rendered by the surgeon of every post, camp, station, or separate command as follows:

1. A weekly statistical report relative to the number of sick, injured, and battle casualties; bed status in hospitals; first occurrence, increase, and flow of the more important communicable diseases; and the status and movement of the various stations and commands in the Army.

2. Special telegraphic reports of epidemic diseases.

3. Special reports of acute communicable diseases prevailing at stations when troops are transferred from them.

4. Reports of acute communicable diseases occurring among troops en route.

5. Reports of acute communicable diseases, births and deaths to civil health authorities.

6. Reports of births and deaths to the United States Bureau of the Census.

7. Monthly sanitary report.

8. Monthly venereal report.

It has already been stated that reports must be rendered on births in hospitals, as well as births on or near a military post if the birth is attended by a medical officer or contract surgeon. Attention also was called to the necessity of reporting on cases of communicable disease and deaths of persons in the command or of persons residing at the military station. These reports are required by the military authorities. In addition to the satisfaction of this military duty, Army regulations require that the senior Medical Officer of each station or command acquaint himself with the civil laws and regulations which govern the reporting of communicable diseases, births and deaths in the community in which the station or command is located. It is further stipulated that the original copy of such report bearing the signature of the reporting officer be forwarded to the civil office in question.

Furthermore, Army regulations require that all births and deaths occurring at military stations or in military commands in any state, territory or insular possession of the United States be reported to the Bureau of the Census. Regulations require that in submitting such reports to civil health authorities, a notation be made on the form that the case was reported to the Bureau of the Census, and vice versa.

It may happen, and does happen, that deaths in moving commands and particularly in airplane accidents may be reported to a civil authority but not in the same county or state where death occurred. The moving of the victim of an accident to the nearest or most adequate hospital facilities may take place across an intercounty or even an interstate line. In the first instance, the coroner of the wrong county may be notified, and in the second, the report may be made to civil authorities of the wrong state. In justification, in certain instances, it may be pointed out that there exist no Chinese Great Walls between counties or states, and it is difficult at times to discover in what county or state an accidental death occurs. Aside from such peculiar and infrequent cases, there is no reason why reports of vital records referring to Army personnel should not be rendered to the proper civil authorities. The Army realizes that the report of births and deaths should form permanent records in the offices to which they are sent and that these records are often of great legal importance. This is the reason that the original copy bearing the signature of the reporting officer is the form sent to the civilian authority.

During the last war, statistics of mortality of military personnel were noted by the Bureau of the Census in tables separate from those representing the civilian population. There are advantages in this system, especially that of keeping separate tab on the armed forces and civilians. I have been informed by Dr. Dunn and Dr. Linder of the Bureau of the Census that the Army and civilians will probably be consolidated in mortality reports of this war. In any case, accurate reports on mortality will now be difficult to obtain, not so much because of incomplete reporting of deaths as because of uncertainty in estimating population bases or strengths in particular states or places. It is certain that the Army has a far more accurate estimate of its strength than the civil authorities have of their population in any place or state. This is because the Army and the armed

forces in general keep a running report of movements of personnel. The various civilian and military authorities interested in food rationing, civilian defense, social security, military security, industrial, agricultural and military man power, and vital records have no such accurate running check on the shift or migration of population in wartime, or for that matter, at any time. It is important, if not imperative, that a system capable of being so used be devised and put into operation.

I wish to close with the remark that it is my belief and hope that the medical officers of the Army, most of them fresh from civilian life, will coöperate in this time of stress and difficulty with all local and national keepers of vital records to the utmost of their power.

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Community Nursing Service During Wartime*

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THE subject of coördinated community nursing services is an old story which has, during peacetime, long been a preoccupation of progressive public health administrators and workers, and of citizens particularly interested and active in the organization and administration of public health in their communities. Now, during wartime, it takes on a new angle of urgency, if not of immediate necessity. Never has there been a more specific incentive for putting into operation in every community a plan whereby an equitable distribution can be achieved of the total supply of public health nursing that remains for the civilian population after requirements for the military population have been fully met.

The careful, conscientious social planning so important during ordinary times becomes imperative during wartime, if all wastes of man power and facilities are to be eliminated, and if the deficiencies in availability and quality of service so characteristic of a lack of social planning are to be overcome.

We are all familiar with the quantitative and qualitative disparities in public health nursing that existed in ordinary times between geographical regions, between town and country, and between individual communities. Now, in many places, movements of population have accentuated these disparities, and in numerous communities sudden growths in population accompanied by shortages in hospital facilities and in medical and nursing personnel have brought into sharp relief the inadequacies in their health services. Health problems have been aggravated or intensified and new ones have arisen, which place greater demands than ever upon the usual public health nursing resources.

We are now faced with the dual problem of transferring public health nurses from communities where the conditions are least acute to under-served communities, and, also, of releasing eligible public health nursing personnel from civilian to military service.

When more babies are being born and fewer women can be delivered in hospitals, or when the women who are delivered in hospitals stay there for a much shorter period, then the needs for maternity nursing in the home are bound to expand. More home deliveries and discharge from hospitals early in the postpartum period mean more public health nursing, if not for direct service only, certainly for a combination of direct service and supervision and teaching of helpers of various kinds.

When there are fewer physicians at the same time that there is particular need for additional vigilance and education in the control of acute communicable disease, tuberculosis, and venereal disease, nurses with training

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and experience in the public health aspects of those conditions are also needed more than ever.

When care of children needs to be rationed because millions of women are needed in the manufacture of war materials, then the fewer real or substitute mothers who remain at home to care for children, besides or instead of their own, must be given all the help and education possible in protecting their health and welfare. Nurses with training and experience in supervising and teaching child care in the home are needed for this purpose.

When more of the chronically ill and acutely ill will be cared for at home instead of in hospitals, then more of the types of care, treatment, and instruction, usually given by physicians, will in their absence devolve upon the public health nurse.

These are but a few examples of change in the usual public health nursing situation for which every community must prepare at a time when there are fewer rather than more qualified workers.

Although most of us have no illusions about the nonproductive organizational and administrative practices that have been indulged in and are still prevalent, we realize that any confusion or disunity which hampers the fullest use of trained personnel, unconscious or unwilful as this may be, now amounts to a form of sabotage.

Some illustrations of community nursing services as organized and administered in the present year, 1942, are furnished through an N.O.P.H.N. study now in progress, of needs and organized resources for nursing care of the sick in their homes. To date 12 communities, representing as many states in the northeast, southeast, north and south central portions of the United States, have been surveyed. (Two communities in the Pacific area are to be included in the study before its completion.) One county is included in the sampling, and the 11 other areas are towns and cities ranging in size from approximately 14,000 to 120,000. Even though the communities chosen for this study were known not to have organized resources for nursing care of the sick in their homes—thus eliminating the usual public health nursing association or visiting nurse association—in some of them there still appears to be considerable decentralization of public health nursing among numerous agencies.

Only 2 of the 12 communities surveyed to date, having populations of approximately 21,000 to 25,000 respectively, have no more than 2 agencies administering public health nursing. In one of these, the county health department assumes sole responsibility for public health nursing services, and in the other the services of the county health department are supplemented by those of an insurance company. Both of these communities, which happen to be located in the deep South, are characterized by sudden large increases in population—one having doubled its population and the other having grown from approximately 25,000 to 40,000 within the last 2 years. If the ratio of public health nurses to population is any clue to adequacy of service, it is significant to note that the distribution in one of these is 1 public health nurse to 10,000, and in the other, 1 to 13,000

Because of the proximity of these two towns to military centers, the new population outside the centers is a young one. The needs for maternal care, child health supervision, and communicable disease control and care are particularly great. At present, no home nursing care of those sick with communicable or non-communicable disease, no delivery nursing, and very limited amounts of antepartum and postpartum care are available.

Clearly, in communities such as

these, the answer is not coördination of service or of local redistribution of service, but rather one of national distribution whereby communities not having had such radical changes in population but having adequate or fairly adequate public health nursing resources would release public health nurses for civilian services in these acutely needy communities.

Among the remaining 10 communities of the 12 surveyed to date, the largest number of agencies administering public health nursing in a single community was 11—where 4 official and 7 nonofficial agencies employed 23 public health nurses for a population of about 120,000. This represents the largest city in the sampling. The ratio here is approximately 1 public health nurse to 5,000 people. Included among the 7 nonofficial agencies are 3 industrial plants, employing a total of 6 nurses for services to employees within these plants. The public health nursing services in this community are characterized by a high degree of specialization, both as to administration and types of service. For instance—

By special groups of clients: 5, or a little less than one-fourth of all public health nurses, give service only to industrial workers in the plant; 2 give service to industrial workers and their families; 1 gives service only to recipients of public assistance from the township; 3 give care only to insurance policy holders.

By age groups: 8, or more than one-third, give service only to school children.

By type of disease: 1 gives service to tuberculosis patients only; 2 give to those with venereal disease only; 1 gives to those with acute communicable disease.

This community has also witnessed a rather rapid increase in population because of the particular industries centered there. It would seem to furnish an example of wasteful use of public health nursing personnel, besides numerical insufficiency. In this particular city, it might well be that pooling of all public health nurses and redistribution of their services on the basis of total community requirements by assigning each field nurse, regardless of administering agency, to a definite district for general service would spread the existing public health nursing personnel in a way to give a much more adequate service. As a matter of fact, although more than one-third of the public health nurses serve only the school population, nursing care of the sick, maternity nursing, and infant and preschool nursing supervision are not available except to holders of policies in insurance companies.

The fact that the shortage in hospital beds and personnel is unusually marked in this community and the ranks of physicians are being depleted rapidly, makes one wonder how this city will manage under the present circumstances.

Among the other 9 communities is one county. Here the population of about 274,000 has its public health nursing services administered by 12 agencies—9 being local boards of education, 1 a county department of health, and 2 insurance companies. The local boards of education employ 13 public health nurses, or approximately 31 per cent of all those working in the county. The health department offers a general service exclusive of care of the sick and delivery nursing, and limits its maternity nursing to patients registered for medical care in its own clinics. Two nurses engaged by an insurance company give the usual service to their policy holders.

The ratio of public health nurses to population in this county is 1 to 8,500, which would indicate that even if the direct services of all the nurses were general instead of having those of ap-

proximately one-half of them specialized either by age or special client group, care of the sick and delivery nursing in the home could not be given to any appreciable extent. Here, again, the problem seems to be more one of numerical inadequacy than one of maldistribution.

The smallest town represented in the sampling—one of slightly more than 14,000 people—has its public health nursing services divided among 7 agencies, 3 official and 4 nonofficial, as follows: a city board of health, a city board of education, one division of the state department of health, one industrial plant, two insurance companies, and one tuberculosis association. Since some of the 7 nurses give only part-time service to this community—for instance, those employed by the tuberculosis association, the state board of health, and the insurance companies—the community actually receives the equivalent of the full time of 4½ nurses.

Here, some nursing care of the sick and maternity nursing exclusive of delivery, is given by the nurse employed by the local board of health. It is the only instance among the communities surveyed where a health department administers nursing care of the sick and also collects fees for this service.

This community would seem to be in a position to pool its varied resources to secure a better coördinated and better distributed service from the same number or a smaller number of workers. Now, when numerous agencies are involved to some extent, no preschool health supervision, no communicable disease nursing, and practically no prenatal care are available, although the ratio of public health nurses to population is 1 to about 3,000.

Of the remaining 7 cities and towns which comprise the present sampling, in 4, 3 agencies employ public health nurses, and in 3, there are 6 such agencies. The communities in the former group range in size from approximately 98,000 to 15,000 and in the latter group from 62,000 to 10,500. Just one more example from this latter group—a town of about 15,000 population according to a 1942 estimate—where greatly increased industrial activity has resulted in population disturbances, overtaxed housing resources, and also added needs for health services.

Here, 6 separate groups are involved in the administration of public health nursing—3 separate units of the state department of health, each employing nurses separately for 3 special types of services. Two of the 3 public health nurses engaged for maternity and child health service receive some salary from the local boards of health and education. All 3 are, theoretically at least, assigned to the local board of health, whose executive officer is a layman. One state nurse is assigned for venereal disease control, and the other for epidemiological investigations of certain communicable diseases.

The nonofficial agencies employing public health nurses for services to this community are one industrial plant, one combination visiting nurse and tuberculosis association, and one insurance company. Although the actual number of public health nurses giving some service is 8, it is really the equivalent of the time of 6 full-time nurses.

Using the estimated population figure of 15,000, the ratio of nurses to population would be 1 to 2,500. This very favorable ratio would lead one to expect a comprehensive service, but the survey revealed that only policy holders in one insurance company received nursing care of the sick in the home; that there is no home delivery nursing, and no communicable disease nursing besides epidemiological investigations of certain diseases.

This community seems to afford an illustration of uneconomical use of existing resources through over-specialization, both of administration and direct service, which, in spite of its apparent quantitative adequacy, makes for definite lapses in service. Coördination of the public health nursing services of this community might well overcome these disadvantages, and gain the added advantage of releasing some of the present personnel for services in more needy and inadequately served communities.

When this N.O.P.H.N. survey, made in coöperation with the Metropolitan Life Insurance Company, the U. S. Public Health Service, the U. S. Children's Bureau, and the American Red Cross, is completed, it is hoped that besides showing how public health nursing is administered at the present time in places where no organized resources for care of the sick in their homes exist, it will be possible to suggest patterns of coördination for these and similar communities which if adopted will provide a service more comprehensive in scope and more equitably distributed in accordance with actual need, including nursing service to the sick in their homes.

Because guidance has been sought by many communities and agencies as they have become aware of the necessity for introducing immediate measures to compensate, at least in part, for the depletion of personnel, the N.O.P.H.N. has obtained information from numerous local sources in regard to what has already been done, what plans are under way, and what more needs to be done and can be done. This will form the basis of a statement on essential public health nursing services in wartime, which the N.O.P.H.N. expects to publish presently.* When summed up, this information shows fairly definite and uniform directions.

First, it is generally agreed that community analysis of public health nursing seems a logical first step—an analysis in which all agencies responsible for any part of this service will participate. Such an analysis might well be initiated by a local nursing council for war service.

Consideration then needs to be given to the type of coördinated administration best adapted to the particular community. In some instances, a merger of the voluntary agencies providing public health nursing services may be the answer, whereas in others, it may be a matter of agreements between voluntary and governmental agencies whereby personnel and facilities are interchanged. In some communities, the combining of voluntary and official agencies may be feasible. In this case, a single governing body, representative of the individual agencies and including wider representation as well, would need to be established.

Whatever plan for administrative coordination is decided upon, certain measures can be introduced immediately, for instance—

All public health nursing administrators, supervisors, and instructors, can join a common pool for redistribution of their services over the total number of public health nurses employed in the community for direct service, and the paid and voluntary auxiliary workers. An adequate supervisory and teaching staff is particularly important in wartime because of the larger proportion of auxiliary workers and of less experienced field nurses.

All field nurses employed in the community for direct service can also be pooled—each of them to be assigned for general services to families of a given district. As a first step toward economy of personnel, direct services by a variety of specialized workers should be eliminated.

Opportunities for all public health

* Published in the December, 1942, number of *Public Health Nursing*, p. 659, under the title "Maintaining Minimum Public Health Nursing in Wartime."

nurses in the community, regardless of former agency affiliation or special type of service, to prepare themselves for general service, including care of the sick and injured, can be provided through refresher courses.

Community mobilization of non-public health nursing personnel for all functions that do not absolutely require public health nursing training and experience, and which can be performed under the supervision of public health nurses, is quite generally under way. Both nursing and non-nursing, paid and volunteer personnel, are being considered in this connection. The value of these workers obviously depends greatly upon the provisions made for their in-service training and supervision.

Within each agency, too, adjustments can be made which will help to utilize more fully the public health nurses who remain. Modifications in administration which are being quite generally introduced are as follows:

GENERALIZATION OF DIRECT SERVICE BY EVERY PUBLIC HEALTH NURSE IN THE AGENCY

Provision for in-service education are especially important during wartime because the better prepared and more experienced staff nurses will have more responsibility for the supervision of the less experienced staff nurses and auxiliary workers. For this, they will need to be prepared on the job.

Decentralization or centralization of administration and service, depending upon the size of the community, transportation facilities, etc., is being studied by public health nursing agencies to discover which is more economical.

In some large urban communities, agencies employing a large number of nurses have concluded that setting up branch offices or sub-stations for less than 8 or 10 nurses is uneconomical because of the added cost of maintenance. In more rural or smaller urban communities where fewer public health nurses are employed, but where transportation is a significant factor, there is a trend toward greater decentralization, both for administration and for service.

Naturally, the more uses to which a branch or sub-station can be put, the greater the economy. Medical clinics, nursing conferences, and group instruction, supervision and in-service training of regular and subsidiary staff, and services to individuals to reduce the number of home visits, are all activities that can be conducted in branch offices or sub-stations. Reduction in the number of times that nurses report to their offices is also an item in time saving.

The use of auxiliary personnel has been mentioned already in connection with community organization. Assignment of auxiliary workers, paid or volunteer, nurses or non-nurses, to any particular group, either according to diagnostic, economic, or other status, should be avoided. Work should be assigned only on the basis of the particular condition of the patient or the particular situation in the home.

Selection of cases for nursing service is particularly necessary when economy of public health nursing has to be practised as rigidly as it does during wartime. Selection should be considered at the time when the individual is referred for or seeks care and when continuation of care is planned. Securing the most pertinent information from the patient at the time when admission for care is under consideration and periodic review, both medical and nursing, of long-term cases such as tuberculosis contact, latent syphilis, and chronic conditions of many kinds, are, among others, significant factors in the mechanics of selectiveness.

Group instruction and service need to be substituted for individual service in

the home wherever possible. There are several types of service where instructions and demonstrations can be given to groups; for instance, tuberculosis, maternity, child care, home nursing and care of the sick, diabetes, heart disease, and rheumatic fever. Group education can well be directed to those responsible for care of children in day centers or foster homes, and to groups of industrial workers. Certain kinds of nursing treatments can also be given at centers at specified times to several persons instead of making visits to homes of individual patients.

More delegation of responsibility to the family will make it possible for public health nurses to devote themselves more and more to teaching and to supervising care given by others. In the home, members of the family, relatives, and neighbors will be prepared for performing many nursing functions under the supervision of qualified public health nurses, which have hitherto been given by professional nurses. Although this has long been considered desirable, it has not been put into practice as widely as necessity now demands. Assumption of more responsibility for health services presupposes education of the family by the public health nurse in the intelligent use of community health facilities.

Review of medical policies, standing orders, and outlines of work needs to be undertaken with the medical advisory group at reasonably frequent intervals. In some communities, because of shortages of medical personnel, standing orders need to be enlarged and extended when it becomes necessary for public health nurses to give certain types of care, treatment, and instruction which were formerly given by physicians.

Recording and reporting, if simplified to the utmost, will save considerable time and effort of public health nursing personnel. The elimination of nonessential record items, avoidance of duplication of information, and streamlining of report and records systems, are all involved. As many activities as possible connected with the keeping and filing of records and reports should be delegated to clerical or auxiliary personnel. Uniformity of records and reports will prevent duplication, delays, and confusions.

Organizational and administration procedures such as these will suggest a great many others, which, if systematically applied, will prove effective in spreading the services of public health nurses as widely as possible. It is obvious that our peacetime standards can neither be retained nor attained during wartime, but I for one am convinced that if everything we have learned about public health nursing administration through our peacetime experience of the last 10 or 20 years is now consistently and universally applied, great economies of personnel can be achieved without too great a sacrifice in quality of service.

An Outbreak of Typhoid Fever Due to the Small Colony Variety of *Eberthella typhosa*[*]

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IN September, 1940, an outbreak involving 13 cases of typhoid fever occurred among a family group of Negroes in a rural area of Twiggs County, Ga. Laboratory investigation revealed the causative organism to be the small colony variety of *Eberthella typhosa*. Clinically no significant peculiarities could be detected. There were two fatalities.

While epidemiological investigation failed to reveal a carrier source of this outbreak, it was later found that one of the family (Mamie G.) visited an unrelated home 8 miles distant in July. In this home were two children critically ill with fever. Both died on the 10th day after onset. A physician who was not called until just before the children died made a tentative diagnosis of "colitis." Two weeks later Mamie G. developed an illness which was not diagnosed by her physician. About 1 month later 13 others in the family became ill. It was not until then that laboratory studies were begun, and a diagnosis of typhoid fever was established and confirmed. It thus appears evident that the epidemic can be traced to the two children who died in July. Beyond this point no definite information could be obtained.

Sporadic occurrence of typhoid fever due to a small colony variety of *E. typhosa* has been recognized in Georgia over a period of 6 years prior to this outbreak. From 11 patients the small colony variant was isolated 22 times from blood, feces, urine, and sputum.[1] No significant relationship of these cases was established.

While literature contains a few references to the isolation of the small colony variety of *E. typhosa* from blood and feces,[1, 2, 3] only one report involved such isolations from an epidemic. In 1910, Jacobsen[2] reported an outbreak of typhoid in an insane asylum in Denmark. From 50 blood and feces cultures he obtained only 2 isolations, 1 from blood and 1 from feces. These were of the small colony variety. In a recurrent outbreak in the same institution 4 months later he isolated the small colony variant from 2 convalescents. It is reasonable to infer that this epidemic was entirely due to the small colony variety of *E. typhosa*.

Cultural characteristics of the small colony variety differ from those of typical strains of *E. typhosa*, (a) in the size of the colonies on extract and beef infusion agar, and (b) in their reaction on Russell's double sugar slants (acid

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butt and acid slant with very small colonies). On extract and infusion agar the colonies average 0.2 and 0.3 mm. in diameter after 24 to 48 hours' incubation, but grow to a diameter of 1 to 2 mm. on agar containing utilizable sulfur, such as Endo's and bismuth sulfite plating media or Kligler's iron agar slants. Cultures of the small colony type, plated on plain agar, produce after several days' incubation a few large colonies which grow up among the small colonies, but which, on subculturing, do not revert to the small colony type. A few large colonies may also appear simultaneously with the small colonies on agar inoculated from broth cultures. It is difficult to maintain the small colony subcultures free of large colonies.

No evidence was found that this small colony phenomenon had any influence on normal antigenic behavior. Large colony substrains descending from small colony parents likewise seem to be antigenically similar to parental and to normal strains. By application of the bacteriophage typing method of Craigie and Yen[4] all strains isolated in this study were found to belong to Type E.

This outbreak afforded an excellent opportunity of observing the persistence of the small colony form in repeated stool culture examinations. Table 1 shows the number of isolations from each patient.

The significance of the small colony variant of *E. typhosa* is yet to be determined. However, the scanty growth on solid media not containing utilizable sulfur could well result in failure of recognition. Especially is this true when applied to Russell's or Krumwiede's sugar slants. On these media the colonies are very minute, and both butt and slant give an acid reaction which persists for several days or longer. By one unacquainted with these reactions such cultures are apt to be discarded. There is no reason to believe that small colony variants of *E. typhosa* are peculiar to Georgia, or any geographical section. It is advisable, therefore, that enteric bacteriologists include in their armamentaria one or more plating media containing sodium sulfite or its equivalent.

SUMMARY

A small epidemic of 13 cases of typhoid fever due to the small colony variety of *E. typhosa* is described.

The outstanding cultural characters

TABLE 1

Showing the Persistence of the Small Colony Variant of E. typhosa in Repeated Stool Cultures

				Results of Stool Cultures											
Patient	*Age*	*Sex*	*Blood Culture*	*Oct. 1*	*Oct. 8*	*Oct. 12*	*Oct. 14*	*Oct. 22*	*Oct. 29*	*Nov. 5*	*Nov. 12*	*Nov. 19*	*Nov. 26*	*Dec. 3*	*Dec. 10*
H.T.	2	F	None	*	+	+	+	+	−	−					
J.R.G.	2	M	None	+	−	+	+		+	−	−	−			
M.G.	4	F	Pos. Sept. 23	*	−	+	+	+	+	−	−				
W.T.	7	M	Pos. Sept. 23	+	+		+	+	−	−	−				
J.T.	8	M	Pos. Sept. 23	*	+	+	+	+	+	+	+		−	−	−
L.T.	9	F	Pos. Sept. 16	+	−		+	+	−	−	−				
L.T.	11	F	Pos. Sept. 23	+	+		+	+	−	−	−				
J.T.	11	F	Pos. Sept. 16	+	−		+	+	−	−					
R.T.	13	F	Pos. Sept. 23	+	−		+	+	−	−					
L.M.T.	15	F	Neg. Sept. 16	+	+		+	+	−	+	+	−	+	−	−
W.P.T.	16	F	Neg. Sept. 24	+	+		+	+	+	−	−	−			
F.T.	19	M	Pos. Sept. 16	†											
M.T.	45	F	Pos. Sept. 16	‡											

* Unsatisfactory specimen
† Died Sept. 26, 1940
‡ Died Sept. 21, 1940

of the small colony variety of *E. typhosa* are reviewed.

It is suggested that to insure the detection of small colony variants of *E. typhosa*, laboratories engaged in enteric bacteriology employ plating media containing utilizable sulfur.

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Nutritional Needs of American Youth*

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IN the past the diet of persons at certain ages or periods regarded as critical has been of special concern. Most energy in diet education has been focused and expended on the expectant mother, nursing mother, infant, and child. Actually, proper nutrition is important at all ages. That utterance has long been such a commonplace that its full import became much depreciated. Recent findings, however, have imparted to it such a newer and deeper meaning that nutrition of the adolescent, adult, and senescent, no less than of persons at the other ages and periods which up to now have so largely preëmpted our concern, take on a new importance. Accordingly, most of what I have to say applies to all ages. But I shall mention some matters that apply especially to youth, and make that period of particular significance.

In speaking of nutritional needs it is not my intention to review, one by one, each of the nutrients necessary for growth and prevention of deficiency diseases since they are familiar, in greater or lesser measure, to all of you. Rather, it is my purpose to comment on the nutritional condition of our people, and to suggest what needs to be and what may be done.

CHRONIC FORMS OF DEFICIENCY DISEASES

Several surveys in the various sections of our nation have shown the prevalence of dietary deficiencies to be relatively high. Yet physicians have insisted that they rarely or never see deficiency diseases. For some time this has seemed to be an insolvable discrepancy, but it now turns out to be no contradiction whatsoever. By the notions of deficiency diseases which have prevailed, the physicians are quite correct in their assertions. But these notions, since they are exceedingly narrow, do not cover actual existing conditions. In speaking of deficiency diseases, physicians have been thinking of the severe acute form. Until recently none other was recognized. Almost all the medical literature bears only on the severe acute form. Nearly all animal experimentation has been aimed toward its production. Actually, there is relatively little of the severe acute condition in this country. There is much deficiency disease but it is in another guise.

Recently it has been demonstrated that there is widespread prevalence of deficiency diseases, not in the severe acute, but in new forms. It has been found that they are very prevalent in a chronic form. In biological behavior the chronic differs from the acute; whereas the acute is rapid, the chronic is slow in development and slow in response to treatment. Both the acute and chronic processes may be of any intensity from mild to marked. Much is of marked intensity. In brief, deficiency diseases have been demonstrated as widespread in previously unrecognized forms: mild acute, mild chronic, and severe chronic. Furthermore, the acute and chronic may

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be present together. Indeed, the most usual state is an acute, superimposed on a chronic condition. Each may be in a different stage and of a different intensity. Let me emphasize that this refers to each kind of deficiency disease.

Time is a factor in the evolution of both these forms; but it is particularly important in the development of the chronic process. For us, time is age. The prevalence and severity of these chronic processes increase with age. Most of the chronic changes have been regarded mistakenly as characteristic of senescence. Actually, however, they are deficiencies developing slowly over a lifetime. These chronic processes may be seen beginning in childhood. The lower the economic level the more frequently, the more severe, and earlier in life they occur. A boy of 12 in a low economic group may show changes in stages not usually seen in higher economic groups until late in life.

These facts indicate that our past efforts to stamp out malnutrition have as yet fallen short, in many instances far short, of perfection in performance. Further, they show the nature of malnutrition actually present in the population. To know and to appreciate this situation is a long step toward mapping appropriate measures to cope with it. But, beyond this, the new facts alter our outlook on the ways to improve existing nutritive conditions. It is appropriate, therefore, to examine the measures which have already been taken, and to modify and reshape them, where necessary, according to new views. We may have to prepare to take steps in a new direction. The problem is twofold: it is necessary to correct and to prevent.

CORRECTION OF DEFICIENCY STATES

In correction, the first step is examination of persons for appraisal of their nutritional status, for detecting deficiency states. It is necessary to locate in a community the areas presenting the most prevalent and severe malnutrition, to identify the deficient persons, and to determine the nature of the deficiencies. When widespread deficiencies can be demonstrated, the health organization with limited personnel and funds can justify concentrating its resources on malnutrition. Usually, a health organization seeks to focus its activities on the worst areas where the need is greatest. Then too, if malnutrition is to be combated, the malnourished individuals must be identified and their deficiencies detected. Here again, the most severe nutritional cases, requiring the most effort, should be the first point of attack. In such a program of correction, the service that the private practitioner is in a position to render should not be underestimated. Most people consult the clinician professionally at some time during their lives.

Little has been done in examination and detection in the immediate past, except diagnosis of severe acute deficiencies in some hospitals. In schools, the height-weight measurements of children, which used to be conducted routinely, fell into disrepute and discard as an index of nutrition. Then followed a period in which no examinations for nutritional status were made. Now new methods are available for detection of deficiency diseases in their acute and chronic forms in any stage and degree as a means of evaluating nutritional status. At present the bottleneck is the training of personnel in these new methods. In the present unsettled and disrupted conditions, with shortage of medical personnel in civilian practice, and interruption to the supply of examining equipment, plans for training personnel may have to proceed much more slowly and on a smaller scale than in more peaceful times. It may have to await the war's end for full development. But at least the plans may be laid, and a start may be made on small-scale operation.

With the identification of the individuals with deficiency states and the nature of their deficiencies, specific therapy should be administered to them. Malnutrition is a medical problem requiring specific treatment. Unfortunately, in the past, two doctrines, entirely inadequate and misleading in principle, have been disseminated. It has been taught that change to an optimum diet is all that a person needs for correction of his deficiency states. It was implied that conversion to a good diet would correct effects of previous errors promptly and completely. It is true that the diet should be corrected: for one thing, to supply the necessary basal level of all dietary essentials; and for another, to form, restore, or inculcate proper dietary habits which will sustain the person in the future and prevent the recurrence of deficiency states once they are corrected. But specific therapy is needed for complete and effective treatment of deficiency states.

The second viewpoint has been that deficiency states respond dramatically and quickly to therapy, and that a few days' or few weeks' therapy is sufficient. That is true for the severe acute forms, the classical textbook conditions. With them, the results are often quite spectacular. But relatively few such forms occur. Most deficiency states are mixed, acute superimposed on chronic. In treating them, the symptoms of acute process vanish promptly under therapy; then the tissue changes characteristic of the acute form next disappear. The chronic lesions recede not in a few days or weeks, but only after a very long time —several years for advanced states. Clearly, the therapeutic regimen must conform to these facts.

In view of these facts, it is clear that chronic deficiency states which start in youth should be corrected then, before they have advanced to late stages where the necessarily long period of therapy makes it a more difficult, laborious, and expensive problem to carry it to completion. Moreover, the earlier the states are detected and corrected, the earlier interest is aroused in keeping free of these states by proper diet.

These deficiency states, moreover, are accompanied by unpleasant and handicapping symptoms. Also, there are strong indications that these states developing insidiously predispose to more serious, overshadowing diseases. With new tools we are on the threshold of testing that hypothesis. If it is found to be true, the earlier the deficiency states are corrected, the less should be morbidity and premature mortality. It is not fanciful to presume that prompt correction of deficiency disorders, adding very considerably to the number of years in excellent nutrition, would bring a healthier, happier, and longer life.

PREVENTION OF DEFICIENCY STATES

It is necessary not only to correct, but also to prevent deficiency states. Either step alone, would constitute an incomplete program. Because correction is so expensive, it is especially important to stress prevention. Once deficiency states in a person are corrected, it is essential to prevent recurrence. Better still, it should be the goal to prevent these states from ever occurring. That emphasizes the necessity of starting the preventive work early in life, and underscores the work with youth. Much of this preventive work takes the form of education in proper dietary habits. One of the outstanding effects of finding chronic malnutrition so prevalent is the impressive realization that diet education has an even greater importance than has previously been appreciated, that it must be extended to the utmost, and that it must be raised to new heights of effectiveness.

In view of our new insight into conditions and the greater significance to be attached to diet education, it would be wise to consider whether the program

as conducted at present will satisfactorily fulfil its purpose. Our new conception of the problem may call for a new rationale and design of action. In the past it has been emphasized that poor diet resulted in deficiency diseases. Always was visualized and meant the severe acute forms. Up to now growth and prevention of these forms of deficiency diseases have been the inducements to take an adequate diet. But, inasmuch as these severe forms have so seldom been seen, the incentive must have lost some of its edge. Prevention of diseases seldom seen is not a strong incentive to eat proper diet. Our people should be told that their present faulty dietary habits lead most frequently to insidious, chronic malnutrition, often with periodic exacerbations.

Then too, although the necessity of a good diet every day for a lifetime has been taught, it has not perhaps been sufficiently impressed. The gravity of slight dietary deficiencies prevailing for years has not been emphasized. This is understandable since, until recently, ill effects were unrecognized. Now we know that these effects do occur, that they are very widespread, and that they are cumulative over the years. These chronic and slight acute forms, not the severe acute, constitute our malnutrition problem. Since there is likely to be more concern about preventing a strong probability, or almost certainty, than a more remote possibility, there should be more of an incentive to avert the chronic and mild rather than the severe acute states. It is clear that unless an adequate diet is taken continually, these chronic and mild conditions appear. But, as diet educators must realize and point out, it is difficult to adhere to a perfect diet throughout life. They must emphasize that a lapse for a short or protracted period does leave its mark; that because it is so difficult to observe good dietary constantly, deficiency states are extremely prevalent; that a satisfactory diet must be taken regularly to prevent not only severe forms but more likely the low-grade chronic forms. Or, to put it more simply, an adequate diet must be taken faithfully day after day to insure health.

We must not fail to recognize and admit that under the best circumstances diet education presents difficulties. So insidious is the development of these deficiency states that many persons actually affected with them and manifesting disturbing signs, declare that they feel all right and become aware of their under-par condition only after specific therapy has brought improvement. It is not easy to convince such untreated persons or normal persons of the virtues of a good diet. It is always difficult to preach and promise better health to persons who already regard their present condition, to which they are accustomed, as perfect health. Furthermore, even if such a person is persuaded to better his dietary habits, it is not easy to retain his continued interest. Under the present motivation in diet education, he is led to expect from his changed diet improvements in health which he never realizes or receives.

NEW STRATEGY IN NUTRITION EDUCATION

New strategy in diet education is needed; a new turn should be given to old methods, or entirely new approaches should be tried. I leave the working out of plans and methods to qualified specialists, but I may mention several observations suggesting appropriate and effective lines of action. With accent on youth, on training in proper dietary habits in early years, much more work in the schools is needed. Besides examination system and correction of deficiencies, the curriculum should contain considerable diet education. Second, when coupled with correction of deficiencies by therapy, diet training may be much more effective. Very often

correction by therapy has educational value. It stirs and cultivates interest in diet. When the person experiences the rather prompt benefits in relief of symptoms, he is in a receptive mood for diet education; indeed, he is very frequently activated to seek it. Very often he becomes extremely interested, curious why he was deficient, and is in the proper frame of mind to take his dietary habits seriously. Thus, by utilizing this shift in viewpoint, by fitting it into the program, the effectiveness of nutrition teaching may be greatly enhanced.

Third, the school lunch should be conducted according to dietetic principles. It is with no sense of satisfaction that we learn from surveys that many school lunches are far from satisfactory, and that children who have partaken of them for several years show definite evidences of deficiency states. This raises the question of what may reasonably be expected from the school lunch system. If it is supposed to supply most or all of the day's requirements and to confer complete protection, it is falling far short of the mark. Indeed, that should not be expected, for it is virtually impossible for one meal of natural food, especially a light meal, however carefully planned, to provide the day's needs. If it is supposed to supply what might reasonably be expected in one meal, to be a dependable and potent supplement to the other meals, in short, if it is supposed to supply one good meal a day, no more or no less, in too many instances it is not achieving this more modest and reasonable aim. Its primary purpose should be to serve as a model meal, besides actually supplying part of the day's needs. Through its inculcation of good food habits, the lunch has a place in diet education. But, whatever its function, the lunch system should purvey an adequate meal. To insure this, lunchroom concessionaires should have the benefit of dietary advice and tutelage. Far more lunches are faulty from ignorance than from greed for excessive profit.

Along with new attempts at diet education, whatever the approach, new or old, we should periodically appraise the methods of application. We should not look for unwarranted approval, especially we should not develop a weakness for panegyrics and fulsome flattery. If our methods are not producing results, we should find it out and change our approach.

Still another point is the proper preparation of food. Of food it may be said as aptly as it was of newspapers, that Greeley made virtue so dull in the *New York Tribune,* while Dana made vice so interesting in the *Sun*. Likewise, a meal scientifically correct in every detail may be a tasteless and unappetizing agglomeration. How many persons have shunned some highly nutritive item because at first encounter it was improperly prepared? Of no less importance in the preparation of food is the retention of its nutritive properties. We are just beginning to realize how severe are the losses in vitamins in foods during their preparation.

It is easy to understand the widespread prevalence of chronic deficiency states when we consider the development of tastes through the centuries for natural foods of limited nutritive value and for refined and processed foods, and the losses in preparation in the home. We come to realize how difficult it is to meet requirements always from usual foods day after day, how easily slight deficiencies are incurred over the years resulting in insidious nutritive changes, how close many persons constantly are to more serious conditions. For protection in these narrow circumstances, we have the possibilities of heavy and exclusive dependence on the absolute effectiveness of diet education in attempting to convert radically the fixed dietary habits in our nation, or the enrichment of certain foods to the point

where compositely they allow a margin for safety. As we ponder the magnitude as well as the serious implications of the situation, it seems highly questionable that we should place sole reliance on diet education. Rather, it seems advisable that we take all available and promising steps. Judicious enrichment of appropriate foods adds much to the guarantee of successful nutrition.

NEED FOR RESEARCH

For protection of youth there should be continuance of basic research on foods, as well as on diagnosis and pathogenesis of deficiency diseases, and their possible predisposing influence to other disease. We must never forget that our present advanced position of enlightenment came from painstaking and prodigious research. In this there must be no letdown in so far as it does not draw upon resources needed more urgently for other purposes in our present titanic struggle for life on a human plane. As a matter of fact, newly discovered facts about nutrition constantly streaming from our research laboratories are of incalculable usefulness in the war effort, as well as for the new world of our making that is to come.

THE ECONOMICS OF THE PROBLEM

Another important aspect of nutrition, especially in the provision of an adequate diet, is economics. Obviously, this problem with its solution is international in scope. It is reassuring to note that our government, alert to both its responsibilities and potentialities of effective action, has made definite headway in this exceedingly complex and intricate field. Following this start, it may be expected that continued careful planning, both on the part of official and unofficial agencies, will be directed toward productive results, not the least of which is benefit to health.

For the whole of nutrition there are needed an attitude, organization, and program that encompass its many aspects. To achieve joint action, it is necessary to have breadth of outlook, wide-angled vision. It is time to forsake the narrow for the broad view. No other science cuts across so many specialities. By the same token, it requires the concerted endeavor of all. The expert in one branch should not underrate or overlook the strong force which his speciality may exert against malnutrition. Yet, he must not have an exaggerated sense of sovereign powers of his field. I have talked with physicians who have said: "Malnutrition is only an economics problem." Perhaps some economists share that view. On the other hand, by their attitude, some in the health field seem to proclaim that nutrition is only a matter of education. In truth, it is a matter of economics, agriculture, food technology, education, medicine, public health, chemistry, and physics. Its application should extend to all people of all ages and in all activities.

When the branches of nutrition are viewed in their proper perspective, there is no natural rivalry between groups. For example, there is no basis to raise a false issue over food versus vitamin therapy, as if they were alternatives and a matter of choice when actually each has its own particular place in which it is indispensable and irreplaceable. Food industry and drug houses, aside from their own gain, can be more effective in concord than in rivalry. Physicians should not only diagnose and treat, but should seize the opportunity of advancing diet education. Diet experts, besides conducting their educational activities, should take cognizance of the need for therapy for deficiency states. Then too, in the organization for concerted action, no one special group or interest should be supreme, for none could adequately represent all aspects. Until we can find the formula for consolidated action, we cannot expect to bring our tremendous

strength to bear on the problem and to strike with a mighty impact.

Finally, it is not enough to stir willing workers to action if they are not given a plan. For effective results, an aroused spirit and enthusiasm must have sound direction. We must decide what to do and how to do it. Here, above all, we need ideas which are feasible and promise fruitful results. The need to improve existing nutritive conditions is a challenge to our ingenuity.

In the last few years we have made remarkable progress along the several lines. Never before were we in such a favorable and potent position to carry on effective activity on all fronts. But we have scarcely made a beginning. The nutritional status of our youth will reflect how successful we are in our efforts.

U. S. Chamber of Commerce Organizes Health Advisory Council

The Chamber of Commerce of the United States in Washington announced on February 5 the creation of a National Health Advisory Council to project and carry out a broad program looking to health conservation as an important factor in winning the war.

The National Health Advisory Council will serve to channel approved technical health information developed by the country's sources of scientific study through the business organizations and their members throughout the country so that there may be encouraged a better public understanding and appreciation of medical science as a means of safeguarding public health to win the war.

James L. Madden of New York, N. Y., Vice-President of the Metropolitan Life Insurance Company and Chairman of the National Chamber's Insurance Department Committee, is in charge of the program.

The Council has as its general chairman James S. McLester, M.D., Professor of Medicine at the University of Alabama, Birmingham. Three committees covering community health, industrial health, and individual health, have as chairmen Wilson G. Smillie, M.D., Dr.P.H., Cornell University Medical School, New York, N. Y.; Leverett D. Bristol, M.D., Dr.P.H., American Telephone and Telegraph Company, New York, N. Y., and James E. Paullin, M.D., Professor of Medicine, Emory University, Atlanta, Ga., respectively. Other persons whose membership in the Council was announced included J. Burns Amberson, M.D., New York, N. Y., George Kosmak, M.D., New York, N. Y., Ernest L. Stebbins, M.D., New York, N. Y., Felix J. Underwood, M.D., Jackson, Miss., Bailey Burritt, New York, N. Y., Henry F. Vaughan, Dr.P.H., Ann Arbor, Mich., Philip Drinker, Boston, Mass., A. J. Lanza, M.D., U. S. Army, Washington, W. A. Sawyer, M.D., Rochester, N. Y., Harry E. Ungerleider, M.D., New York, N. Y., Leroy Gardner, M.D., Saranac Lake, N. Y., Russell Wilder, M.D., Rochester, Minn., Marion G. Howell, R.N., Cleveland, Ohio, and Harold M. Marvin, M.D., New Haven, Conn.

Attitude of the Nation Toward Immunization Procedures*

A Study Based on a Public Opinion Poll Made in 1941

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IT is well recognized that wars always increase the hazard of spread of communicable disease. In the present one, in which civilians are so largely involved, certain conditions productive of epidemics may prevail to a greater extent than formerly. Even in as yet an uninvaded country like our own, mass movements of populations to defense plants add a new hazard to the usual one of bringing relatively non-immune rural populations into army centers. Shortages of medical personnel for our armed forces and civilian population are becoming more apparent daily, so that it is of utmost importance that all needless illness be cut to a minimum.

In the armed forces, active immunization to those diseases for which protection can readily be given is easily accomplished, but no such compulsory measures are practical among civilians. It is, therefore, of great interest to study the attitudes of the public toward immunization. Are they ready for such measures? What do they know of them? Do they know when, how, and against what to be immunized? Some of these questions it is now possible to answer as a result of a nation-wide poll taken in September, 1941.

* Presented before the Health Officers Section of the American Public Health Association at the Seventy-first Annual Meeting in St. Louis, Mo., October 28, 1942.

METHOD

A field staff, well trained in technics of interviewing, presented specific questions on immunization against certain diseases to persons scattered over the entire United States. In selecting those to be interviewed, the usual methods used in conducting such surveys * were employed so that an adequate sample of the total population under consideration was secured. Only the adult white population was sampled. Those interviewed were classified according to geographical location (nine divisions of the country), the size of the community (six divisions, including rural populations), economic level (four income groups), age (two groups), and sex. The percentage distributions of the sample and of the general population were identical for each of these criteria, as can be seen in Table 1.

What Is the Prevailing Opinion Concerning Immunization Procedures?

First, interviewers asked, "In your opinion can a person be prevented from

* The survey was conducted by the Elmo Roper organization, probably best known for the public opinion polls it has conducted for *Fortune* magazine. The samples chosen by them have often been proved to represent adequately the opinion of any group under consideration, and in this study they have tested the reliability of the samples chosen. In no instance have data been presented or conclusions been drawn from any sample in which there was not a sufficiently large number of answers to make the data or conclusions statistically significant, unless so stated in the text.

TABLE 1

Distribution of Interviews

Geographical Divisions	*Per cent*	
	Interviews	*Population*
New England	6.4	6.4
Middle Atlantic	21.8	21.8
East North Central	20.6	20.6
West North Central	10.7	10.7
South Atlantic	12.8	12.8
East South Central	8.0	8.0
West South Central	9.9	9.9
Mountain	3.1	3.1
Pacific	6.7	6.7
Total	100.0	100.0
Size of Place		
Over 1,000,000	12.6	12.6
100,000 to 1,000,000	17.2	17.2
25,000 to 100,000	10.1	10.1
2,500 to 25,000	15.8	15.8
Under 2,500	8.9	8.9
Rural	35.4	35.4
Total	100.0	100.0
Economic Level Class Income		
A—well to do	6.8	6.8
B—upper middle	24.7	24.7
C—lower middle	45.5	45.5
D—lower	23.0	23.0
Total	100.0	100.0
Age		
21–39	50.0	50.0
40 over	50.0	50.0
Total	100.0	100.0
Sex		
Total Women	50.5	50.5
Total Men	49.5	49.5
Total	100.0	100.0

getting ——— by being inoculated or vaccinated against it?" Table 2 shows the relatively large numbers who accept the value of such protective measures for diphtheria, smallpox, and typhoid fever, the three diseases for which public health officials most often advocate artificial protection. Those persons who said they did not believe that the diseases could be prevented by specific immunizations were allowed to make voluntary comments after their "yes" or "no" answers had been recorded. Of those who had answered "no," about 60 per cent believed that, because of immunization, a person will have milder forms of the diseases—indicating an even wider acceptance of the procedures than indicated in the "yes" and "no" answers. An additional 18 to 20 per cent felt it might be effective or help in some cases. Only 9 per cent took the fatalistic attitude that "if you're going to get it you're going to get it." There is, thus, apparently little active *disbelief in* or *resistance to* vaccination or immunization. Still let us not forget that 12 per cent do not know if vaccination will protect against smallpox and that larger percentages do not know of protection against diphtheria and typhoid fever.

Do People Believe These Diseases Are Serious?

Respondents were asked to agree to one of a series of specific statements about the seriousness of each of the diseases, and their answers indicate that they understand the nature of the diseases and believe them sufficiently serious to cause concern. It is interesting that they apparently feel smallpox to be less dangerous than diphtheria or typhoid fever. If a lack of understanding of the nature of the disease cannot seem to be the reason why persons are not immunized, what other factors may prevent their being artificially protected?

Are People Deterred from Securing Protection against These Diseases Because of Any Specific Drawbacks?

Answers to this question showed that, in the minds of most persons, there are no serious drawbacks to immunization procedures, 85 per cent stating that there are none or that they know of none. They seem not to differentiate

TABLE 2

Opinion of Respondents Concerning Preventive Value of Immunization Measure against Specific Diseases

	Typhoid Fever	*Diphtheria*	*Smallpox*
Number of respondents	3,047	3,051	3,038
Per cent believing immunization:	%	%	%
Does prevent	65	72	77
Does not prevent	14	12	11
No opinion	21	16	12
Total	100	100	100

much between the measures which protect against the three diseases, except to feel that vaccination is more dangerous than the others.

It should interest those who are concerned with promoting immunization that only 2 per cent of respondents felt such procedures were too expensive or too much trouble. Nor did a history of previous immunization change their opinions. Those who stated that they had been artificially protected volunteered slightly more information concerning the pain or discomfort involved than those who had not, but in general they saw fewer drawbacks.

Thus, the average white adult in the United States finds no specific drawbacks connected with being protected against these three diseases—and his states of readiness to accept all forms of immunization are strikingly the same. Moreover, when asked, 50 per cent of those who had not previously been protected stated that they might be willing to be. Mothers * of unimmunized children were even more willing to have their children protected, for over 80 per cent of them answered affirmatively a similar question referring to their children.

What Do People Know About When to Be Immunized?

The public for the most part seems ready for immunization procedures. Do they know when such action should be taken? An answer may be derived from several of the questions asked respondents in the survey. Those who said they might be willing to be inoculated or vaccinated against diseases they have not had or have not been immunized against were asked, "Under what conditions or at what age would you be inoculated or vaccinated against ——?" Results showed that most of these persons apparently think immunization is necessary only upon exposure.

A similar question was also posed to "mothers" who might be willing to have their unimmunized children protected. Here the picture changes somewhat. A large number still believe in protection only on exposure, but more important is the fact that they believe that 6 years of age is the proper time to protect children against smallpox and diphtheria. Only 3 per cent stated that they would have their children protected before 1 year of age. It is discouraging to remember that, both in the 1930 White House Conference Report [1] and

* "Mothers of children" are defined as those persons who are, in fact, mothers plus those persons who, regardless of sex, are guardians or persons-in-charge of children. In the classification "mothers with children under 5 years old" are included the answers of persons with children both under and over 5, while in the class "mothers with children over 5 years old" are included answers of mothers all of whose children are over 5 years of age. It is not possible to state if the so-called "mothers" represent an adequate sample of the "mothers" in the population under consideration, for in this one characteristic the sample interviewed could not be matched. It will be remembered that the sexes in the sample were distributed as they are in the general population (see Table 2).

in the survey of 1928 summarized by Collins,[2, 3, 4] it was emphasized that there was a tendency to postpone vaccination until school age. It would appear that educational campaigns may well be directed more specifically to this point in the future.

Those who believed diphtheria could be prevented by immunization were asked questions on how often and when one should be immunized. Twenty-five per cent thought one immunization was sufficient; 38 per cent believed more than one necessary; 36 per cent did not know. Although "mothers of children" were better informed, even 25 per cent of them did not know whether one or more than one inoculation were necessary. Add to this the 33 per cent of "mothers" who believe that one immunization is sufficient, and one sees that 58 per cent of those "mothers" who believe in the value of immunization still would probably not be adequately protecting their children if they followed the information they now believe correct.

Of those who felt one inoculation was sufficient, only 41 per cent thought it should be given at 1 year or less, and 17 per cent did not know when it should be given. "Mothers of children under 5" were much the best informed, 72 per cent giving 1 year or less as the earliest age, and only 6 per cent being uninformed. If persons believed that diphtheria immunization was necessary more than once, they seemed uncertain as to when they should be protected, 28 per cent having no idea at all and the remainder volunteering a wide variety of answers. "Mothers" were again somewhat better informed than "non-mothers."

This lack of specific knowledge concerning when to be protected is also emphasized in the answers to the question, "How long does the protection a person gets from inoculation or vaccination against ——— last?" The largest number (72 per cent for diphtheria and typhoid fever and 52 per cent for smallpox) stated they did not know. Others stated periods from less than 1 month to the duration of a person's life. Few stated periods in accord with the more or less well accepted time limits set by medical experts.

Thus, if the public is to be expected to request the physician to give specific protection against these diseases at the proper time, a great deal of education must still be done, for persons do not know when or under what conditions they should be immunized.

CONCLUSION

In conclusion, it seems important to recognize any factors which could lead to the immediate immunization of as large a percentage of the civilian population as possible. The following generalizations concerning the attitudes of the adult white population in the United States seem justified from the results of a public opinion poll taken in September, 1941.

1. In general the public is aware of the value of immunization against and of the serious nature of diphtheria, smallpox, and typhoid fever, and sees no specific drawbacks connected with being inoculated against them.
2. Over 50 per cent of those who are in need of protection say they might be willing to be protected.
3. The public is not well informed concerning when or how often to be immunized. The importance of having children protected against diphtheria and smallpox in infancy needs particular emphasis.
4. Persons responsible for children are generally better informed concerning immunization procedures than adults not responsible for children.
5. In general, the public opinion is sufficiently favorable toward active immunization against smallpox, diphtheria, and typhoid fever that public health officials and private physicians can well urge such procedures as a routine practice.

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Citizen Support for the Health Officer

EDITOR,
The Plainfield Courier-News

There is a big health job ahead all over the nation. Communities are increasing and expanding health budgets to meet new programs and competent health officials are receiving salaries they deserve. . . .

Now is the time for our City Fathers to consider warnings given over and over again by government officials and medical leaders that dangers are increasing, not only from well known diseases, but from entrance into the United States of strange new diseases. Preventive work, which is the business of the health department, must increase in scope and effectiveness. The health department works to keep individuals from being sick by preventing disease from getting a foothold.

Scientists, doctors, and public health specialists are constantly discovering new effective ways to combat and control diseases, old and new. Our city can utilize their wisdom by giving our health officer a chance to expand actual field work and to expand educational services that enlighten and so protect us.

Already that department has helped the general public to understand and benefit by the protection given by pasteurized milk, cleanliness of food sold in our markets, vaccination, choice of really nutritious foods, and service of the visiting nurse—to mention a few services we now take for granted.

Last year, Plainfield's general death rate per 1,000 population was 10.0, but Plainfield's infant mortality rate per 1,000 births was 33.2, a jump from 27.1 of the year 1941. Usually infant mortality is considered an excellent gauge of public health. Last year in Plainfield there were 30 deaths of children under one year. The year before (1941) there were 19. Measles, scarlet fever and diphtheria caused no deaths in our city in 1941 or 1942. Cancer caused the death of 60 persons in our town in 1941. Last year's records list 35 cancer deaths. Cancer is evidently far from wiped out.

Obviously splendid work has been done by our Health Department. (How many know that some recent phases of its work are known in public health circles throughout the country and are used as a pattern?) Obviously there will be need for far greater service in 1943. Health services must increase and must be provided for in time of war by allocation of ample funds. This is no time to "wait and see what will happen." It's no credit to a town to have an underpaid health officer and an undersize budget that limits his work—*Courier-News*, Plainfield, N. J.

Variations in Phenol Coefficient Determinations of Certain Disinfectants*

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IT has become customary to gauge the strength of a disinfectant by its phenol coefficient value; and ordinarily the labels of coal tar phenolic type emulsions and similar disinfectants bear phenol coefficient statements to indicate their germicidal efficacy. Unless the label states that some other organism has been used, the phenol coefficient is determined against *Eberthella typhosa*. In the enforcement of the Federal Insecticide Act it is required that phenolic type disinfectants be used at dilutions equivalent in germicidal value against *E. typhosa* to a 5 per cent solution of phenol, i.e., at 20 times their phenol coefficient values. Thus a disinfectant with a phenol coefficient of 5.0 should be used for general purposes at a dilution no weaker than 1 per cent. This regulation is for the purpose of allowing a reasonable margin of safety so resistant and inaccessible organisms will be killed in general practice.

Wright[6] has shown that different brands of peptones used in the composition of the culture medium will give somewhat different coefficient values. The Food and Drug Administration[5] method prescribes that the culture medium be made with Armour's peptone prepared specially for disinfectant testing purposes. This method has become generally relied upon as a means of determining phenol coefficients; and it has been shown that by this method workers in widely separated laboratories can obtain essentially the same phenol coefficient value on different samples of the same preparation.[2]

In 1940 Petroff and Schain[4] published data showing that the bactericidal properties of germicides are enhanced with the addition of detergents. Within recent years it has become a very common practice to add relatively small amounts of wetting agents to disinfectants with a resulting increase in their phenol coefficients.

It now has been brought out that the phenol coefficient determination alone may not be an adequate laboratory measure of the germicidal value of disinfectants containing wetting agents. During the past year a group of four disinfectants from different manufacturers were tested in the laboratories of the Agricultural Marketing Administration for another governmental agency. Their phenol coefficients were found to be far above the minimum coefficient specified and well above their professed coefficient values.

When the coefficients of these samples were rechecked by using the organisms from two test cultures—I and II—

* Presented before the Laboratory Section of the American Public Health Association at the Seventy-first Annual Meeting in St. Louis, Mo., October 28, 1942.

the results differed from each other. Test culture I gave the results previously obtained while test culture II gave lower coefficients. Both I and II were 24 hour cultures in F.D.A. media inoculated from the same source, the only difference in the media being that the peptone ingredient of culture medium II bore a different lot number, having been purchased about a year earlier than that used for making medium I. The difference between coefficients determined with test culture I and II are as follows:

TABLE 1

	Phenol Coefficients	
Disinfectant	*F.D.A. Culture I*	*F.D.A. Culture II*
A	9.5	5.0
B	15.0	4.4
C	17.0	5.5
D	30.0	14.4

Culture I and culture II are the same except that the peptone used in making the media bore different lot numbers.

Repeated tests showed that the two test cultures possessed the same resistance to phenol. Against alcohol test culture II showed a slightly lower resistance. No difference in the microscopic appearance of the organisms could be observed. The plate count was approximately equal when salt solution was used to make serial dilutions but test organism I showed a greatly reduced count compared with organism II when serial dilutions were made with water.

Disinfectant B was subjected to further study. When six other strains* of *E. typhosa* were cultured in medium I and medium II and used as test organisms against disinfectant B, the respective divergence of phenol coefficients were comparable to those obtained with the Hopkins strain initially used.

It was thought probable that this group of disinfectants contained wetting agents which were responsible for the peculiar variation in their phenol coefficients. Consequently two synthetic detergents* (Tergitol, Carbide and Carbon Chemical Corporation, and Vatsol, American Cyanamide and Chemical Corporation) were added in 0.1 per cent amounts to the phenol dilutions tested against test cultures I and II. In the presence of both of these wetting agents the test organism from culture medium I was killed by the higher dilution of phenol. With 0.1 per cent Tergitol present, a 1–125 dilution of phenol killed test organism I in 10 minutes while a 1–100 dilution was required to kill test organism II; 0.1 per cent Vatsol decreased the concentration required to kill *E. typhosa* from 1–90 to 1–160 in the case of the former test culture and to 1–140 in the latter. In the concentrations used neither of these detergents was germicidal for *E. typhosa*. It appeared very definite therefore that some compound of the nature of synthetic detergents was an ingredient of the disinfectants and responsible for the difference in their germicidal action against the two test cultures.

When washed organisms from test culture I were suspended in sterile medium II the same coefficient value was obtained as when washed organisms from culture II were suspended in medium I. Against these resuspended organisms disinfectant B showed a phenol coefficient of 6.6 compared with 15.0 for culture I and 4.4 for culture II. From this it would appear that the peptone in culture medium II contained some ingredient not contained in the peptone of culture medium I which counteracted the enhancing properties of wetting agents; and imparted this quality to the typhoid organisms cultured in it.

* Kindly supplied by Dr. F. W. Tilly, Bureau of Animal Industry, U. S. Department of Agriculture.

* Obtained through the kindness of Dr. H. L. Cupples, Division of Insecticide Investigations, Bureau of Entomology and Plant Quarantine, U. S. Department of Agriculture.

Baker and coworkers[1] found that phospholipids from various sources inhibited the action of synthetic detergents. Consequently the phenol coefficient of disinfectant B was determined with test culture I in the presence of soluble lecithin as well as Brain Liver Heart Medium (Difco). Added on the basis of 0.1 per cent brain (0.25 per cent complete medium) this preparation reduced the phenol coefficient of disinfectant B to 5.5 while 0.1 per cent lecithin reduced the coefficient to 6.6 and 0.2 per cent lecithin brought the coefficient to 4.0. With either of these sources of phospholipid added to phenol enhanced with wetting agent, the concentration of phenol required to kill test culture I was increased to the concentration required to kill test culture II.

Test cultures I cultured in medium I to which had been added 0.1 per cent lecithin or 0.25 per cent Brain Liver Heart Medium (Difco) reduced the coefficients of all four of the disinfectants below the coefficients obtained with test cultures from the unaltered medium. The results are shown in Table 2; results with test culture II are added for comparison.

TABLE 2

	Phenol Coefficient			
Disinfectant	*Test Culture I*	*Test Culture 1-A*	*Test Culture 1-B*	*Test Culture II*
A	9.5	5.0	4.0	5.0
B	15.0	4.0	7.0	4.4
C	17.0	6.5	7.0	5.5
D	30.0	11.0	16.0	14.4

Test culture 1-A is F.D.A. medium culture I plus 0.1 per cent lecithin

Test culture 1-B is F.D.A. medium culture I plus 0.25 per cent Brain Medium (Difco)

NOTE: By using the current lot of prescribed peptone the following phenol coefficients were obtained: A 6.0, B 6.0, C 9.0, D 19.5.

The results of this investigation definitely indicate that one lot of the prescribed peptone for F.D.A. medium contained phospholipid substances lacking in another lot. These phospholipids are extremely important in the determination of phenol coefficients.

DISCUSSION

Consideration of this report leads to the conclusion that phenol coefficient statements on certain disinfectants containing synthetic detergents are of little or no value. With a determined phenol coefficient of 15.0 for disinfectant B, it might properly be considered a safe general germicide when diluted with 300 parts of water. It was found, however, that a 1–150 dilution of this product failed to kill *Escherichia coli* in 5 minutes and a 1 per cent solution failed to kill pyocyaneous (*Pseudomona aeruginosa*) in 10 minutes. Incidentally a 10 per cent solution of this preparation also failed to kill *Staphylococcus aureus* in 10 minutes. Used according to customary standards, such a product may be valueless as a disinfectant or it may be an effective germicide, depending upon the composition of the peptone used in culturing the phenol coefficient test organism.

The use of peptone with known phospholipid content may become important in the germicidal testing of disinfectants containing wetting agents. However, not all phospholipid substances appear to affect different synthetic detergents alike; and there are many such detergents now available. Cupples[3] in 1940 listed over 300 individual preparations of this nature. In connection with the above investigation it was found that added Brain Heart Medium (Difco) was slightly more effective than 0.1 lecithin in lowering the phenol coefficient of disinfectant B when using test culture I; this was contrary to the effect when these enrichment substances were used in the culture medium (see Table 2). Both were approximately equal in reducing the effect of the two detergents added to phenol. But lecithin was much more active than the Brain Heart Medium when added to Zephiran, a surface-

acting compound with high germicidal activity. Zephiran diluted 1–30,000 killed test culture I, and diluted 1–20,000 killed test culture II; 0.25 per cent Brain Heart Medium also reduced its germicidal dilution against test culture I to 1–20,000; but 0.1 per cent lecithin prevented a 1–2,000 solution from killing test culture I in 5 minutes.

The problem of finding a laboratory method for testing the germicidal properties of disinfectants containing synthetic detergents, just as reliable as the phenol coefficient method is for basic coal tar disinfectants, does not appear to be easy of solution.

SUMMARY

Data presented show that the peptone component of the medium for culturing phenol coefficient test organisms may seriously affect the phenol coefficient obtained. This effect on the test culture is not detectable from the results of the phenol control.

It can be deduced from this investigation that when tested against *E. typhosa* the germicidal activity of disinfectants containing synthetic detergents is greatly altered by the phospholipid content of the culture medium.

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Comparative Nutritive Value of Butter Fat and Vegetable Oils*

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SOME 25 years ago [1] it was shown that milk fats were superior to vegetable oils because they contained vitamin A, which was not contained in the vegetable oils. Because of this fact legislation was enacted in various states prohibiting the removal of fat from milk and replacing it with a vegetable oil. In other words, the manufacture of "filled milk" was prohibited by statute in many states, and also by the federal government. Within the last few years those who would like to make a filled milk have learned how they can add vitamins A and D to these vegetable oils and then claim a nutritive value of the product equal to that of milk. By getting out an injunction against the enforcement of the filled milk legislation and prohibiting the enforcement of the law, these companies have succeeded in distributing very considerable quantities of "filled milk." In some states decisions in reference to the validity of the filled milk legislation are pending. In other states licenses are given allowing the manufacture of filled milk, but with an imposed tax.

Now, what is the situation in reference to the nutritive value of butter fat as compared with the vegetable oils? When a vegetable oil fortified with vitamins A, D, and E is homogenized into skimmed milk to a 4 per cent level and the skimmed milk reinforced with iron, copper, and manganese, there is always an inferior growth of young weanling rats as compared with rats receiving butter fat.[2] Not only do the rats on butter fat grow better, but they look better; and when kept for reproduction studies, marked superiority in numbers born and reared results.

This growth stimulating property of butter fat lies in the saponifiable fraction,[3] since feeding the non-saponifiable fraction with corn oil or coconut oil did not give the results obtained with the butter fat. This superiority of butter fat is not due to a phosphatide or any constituent of a phosphatide, such as choline or cholamine.[4] It seems to be due to a saturated acid (or acids) of high molecular weight which is not present, at least in quantity, in the vegetable oils investigated. Hydrogenation of the unsaturated fraction of butter fat results in a product which when added to corn oil gives a growth response superior to the butter fat itself. Hydrogenation of the vegetable oils, such as corn oil, cottonseed oil, soy bean oil, and coconut oil, did not improve their growth promoting properties.[5]

These results make us believe that, in addition to its vitamin A content, butter fat is constitutionally superior to the vegetable oils investigated. This

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applies particularly in the nutrition of young rats. Similar experiments, however, and similar results with calves have been secured at the University of Minnesota.[6] Possibly all animal fats are superior for the nutrition of the young to the vegetable oils because of their content of certain essential fatty acids. I do not here refer to the unsaturated acids like linolenic, which prevents what is known as the Burr's disease. These results for the first time show that constitutionally butter fat is superior in the nutrition of a young animal, like a rat, to the vegetable oils investigated. They also make it clear that reinforcement of a vegetable oil with vitamins A, D, and E, will not make it equal in nutritive value to butter fat for the young. These results also make it clear that "filled milk" as at present made, should not be allowed to get into the channels of infant and child nutrition. It may be a healthful food but it shows some deficiencies, just as do many of our staple foods; but where a food becomes the *sole* nutrient of the young, such as whole milk does, then the commercial distribution of an inferior substitute should be prevented.

SUMMARY

Experiments with young rats indicate the superiority for growth of butter fat as compared with certain vegetable oils. This superiority rests upon a constitutional difference and is not related to the differences in vitamin content.

As the sole article of nutrition a "filled milk" in which a vegetable oil has been substituted for the butter fat, based on rat experiments, could give inferior growth with the infant; but no such experiments have been carried out. Until they have and an equality is established, if it exists, the burden of proof of equal value must rest with the purveyor of filled milk, and the public should be protected from a substitute for natural milk.

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THE BEVERIDGE REPORT: A SPRINGBOARD FOR THIS EDITORIAL

THAT document which has come to be known as the Beveridge Report (Social Insurance and Allied Services in Great Britain) is now attracting considerable attention and doubtless will continue to interest economists, governments, social agencies, and the medical profession in this hemisphere. In due time, the Report will be reviewed in the JOURNAL. For the moment, it may be said that it sets forth a carefully considered plan, proposed for social security of the people of Great Britain. According to the author, ". . . the aim of the Plan for Social Security is to make want under any circumstances unnecessary." In relation to medical service, this is said: "Medical treatment covering all requirements will be provided for all citizens by a national health service organized under the health departments and post-medical rehabilitation treatment will be provided for all persons capable of profiting by it." These are bold and forthright statements, clear-cut in their simplicity. They leave no room for confusion as to objective.

The wisdom and applicability of this plan, in its relation to Great Britain, is obviously a matter for Great Britain and only Great Britain to decide. For one in another nation to voice a vote yea or nay would be presumptuous. But in relation to the United States, this Beveridge Report is of particular interest at the moment, for recent news items indicate that the federal government will undertake to provide for the United States a social security plan more inclusive than that which now exists. Inevitably, then, pending announcement of this plan for the United States, and even after that, the Beveridge Report will be scrutinized in terms of its adaptability to the situation in this country. The nature of scrutiny of this document, and of the plan for the United States, will not in all cases be objective and dispassionate. On the contrary, predilections, prejudices, opinions, affiliations, and other conditioning factors will cause many to view all such plans with a jaundiced and tory-like eye; and similar factors will influence about an equal number, out-of-hand, to regard any social security plan as a cross between

the Bill of Rights and the Emancipation Proclamation. Thus there will be those who believe that the bedrock of a successful civilization must rest completely and only upon the full exercise of personal initiative and responsibility and devil take the hindmost, and those who believe that the successful person is, at a minimum, three-fourths rogue, and that the mere fact that a man is down and out is *prima facie* evidence that he is a fine fellow who has been unjustly dealt with.

With these conflicting thoughts, opinions, and interests, it will, of course, be difficult to discover the ideal arrangement, either within the broad field of sociology or in the narrower one of medical care. While it is not probable that the true answer is to be found in an exact middle ground, it is equally unlikely that the solution lies in either one of the extremes. Somewhere in between, to the right or to the left of the center, is the course of wisdom. This wise course is not likely to be reached through an approach giving emphasis to the "rights" of those who have had neither the intelligence nor the integrity to take care of themselves, nor will it include a philosophy that those who have shown initiative and thrift owe something to those who have wasted their opportunities. It will, however, recognize that even in as wealthy a country as this, no inconsiderable proportion of the population is made up of fine American citizens who have been unable to get beyond a bleak subsistence level; that, though possessing initiative and in no way inclined to lean upon others, many millions under the pressure of living have not succeeded in accumulating savings or investments and who, though they have worked faithfully and intelligently within their respective spheres, are not in position to meet the catastrophes of sickness and unemployment. Here the situation exists not because of personal ineptitude or stupidity or slothfulness but rather because of the complexities of a social order to which people of this sort contribute substantially, but from which they receive but meager returns. If there is any logic or strength, or the seeds of permanency in that civilization which created these complexities, it is in all decency obligated to take such measures as may be necessary to offset want and injustice. Families of the sort mentioned, caught in the economic maelstrom, do have rights, and are entitled to social security.

As regards medical service, it seems sensible to conclude that, complementary to private practice, there is need of providing some pooling of resources which will assure good professional care to those who cannot otherwise obtain it. We are not sufficiently an economist to know whether the medical service should be supported by an over-all tax or on an insurance basis. We are inclined to think the latter, but probably hold that opinion because of a desire to avoid being taxed for a service we should not expect to use. If medical care is to be on an insurance basis, it would be necessary, probably, to make such insurance compulsory for those who benefit by unemployment allowances or similar security provisions. Perhaps it should be optional for others. It would be essential, too, so to organize and administer the medical service that it would function on as high a level, and professionally as independently, as a hospital staff. In these opinions we undoubtedly reflect our own predilections, affiliations, and conditioning factors, but we are not naïve enough to think that the matter is as simple as set forth above, nor so inexperienced as to believe that any plan adopted would be free of undesirable elements, deficiencies, and pitfalls. In any event, we believe that if a wise course is to be charted, it is about time that the sane majority of

physicians and the public make themselves heard. This is not a situation which can be benefited either by a blind defense of the status quo or by advocating change for change's sake.

THE ATYPICAL PNEUMONIAS

MORE and more, in medical and public health journals, there are appearing reports of a respiratory infection, or infections, which presents unusual characteristics and unexpected pathology. At present the situation is not clear, but in substance it is this: Clinicians have discovered that many individuals who appear to have only a moderately severe acute upper respiratory infection, prove on x-ray to have a pneumonia. Naturally the severity of illness varies from case to case, but there is general agreement that the results of physical examination are not an index of the underlying pathology; that the patient seems sicker than physical examination of the chest would lead one to expect; that bacteriological investigation does not yield significant findings; that the ordinary chemotherapy of pneumonia is ineffective.

There is no agreement as to how the disease, or diseases, should be designated. Part of this confusion is incident to limitation of knowledge, part of it reflects differences in approach. From a clinical standpoint, the patient presents an unusual condition, and there have thus arisen such terms as "Atypical Pneumonia," "Atypical Pneumonia of Reimann," "Atypical Bronchial Pneumonia," "Atypical Pneumonia with Leukopenia," "Grippe," "Current Bronchial Pneumonia of Unusual Character and Undetermined Etiology," and "Primary Atypical Pneumonia, Etiology Unknown." The last two terms obviously are giving consideration not only to the clinical aspects, but to the etiological. Also from the etiological standpoint other designations are used; "Virus Pneumonia," "Type A Virus Pneumonia," "Acute Infection of the Respiratory Tract, Type A," "Acute Influenza Pneumonitis," "Acute Influenzal Pneumonia." Then on the basis of x-ray findings and underlying pathology, there arise the terms "Pneumonitis," "Acute Pneumonitis," "Acute Interstitial Pneumonitis," "Disseminated Focal Pneumonia," "Benign Circumscribed Pneumonia."

In spite of so many different descriptive titles, there is a tendency to believe that one etiological agent is responsible, probably a virus. As against this hypothesis is the situation in regard to influenza in which there was thought to be a single causative organism, but where further research indicates that at least three distinct etiological agents are involved. Specifically, in connection with causative agents, there has come from the National Institute of Health the report that in a small outbreak of pneumonitis in a group of laboratory workers there was recovered a rickettsia which exhibited the characteristics of a rickettsia previously isolated from cases of "Q" fever. Some time ago, too, the Research Laboratory of the California Department of Public Health reported the isolation of a psittacosis-like virus from two persons who had died of atypical pneumonia; and a more recent paper from the same source indicates that an identical virus was recovered from two cases of atypical pneumonia arising from laboratory infection. A report from another source suggests an association between this

type of pneumonia and a virus which causes pneumonia in cats. Research has been carried out by others, and investigations continue.

Epidemiologic study of so-called virus pneumonia has not progressed as far as is desirable. A deterrent to further advance along this line is the fact that the condition frequently remains undiscovered. In many instances no physician is called or, if called, he may fail to make a correct diagnosis, a failure likely to occur in the absence of x-ray examination of the chest. Finally, it is seldom that even those cases diagnosed come to the attention of the epidemiologist, for few health departments require the reporting of atypical pneumonia as such. The New York City Board of Health has recently made the condition reportable, as doubtless has been done in one or two other forward-looking places. In spite of the lack of knowledge as to causative agent or agents, reporting regulations would seem to be one additional means by which further information may be obtained. It might be well for health officers to give thought to regulations of this sort.

THE YEAR BOOK

This issue of the JOURNAL, for several years, has been supplemented by the *A.P.H.A. Year Book*. Initiated in 1931, and continued in successive years, the twelfth volume, that for 1941–42, will probably be the last for the duration.

The Executive Board has decided to suspend publication of the *Year Book* as an economy measure and as a means of meeting the Government's request to publishers for a 10 per cent reduction in the use of paper.

The JOURNAL will carry from month to month the essential material that has been concentrated in the *Year Book*. A list of Association and Section Committees with their personnel is published in this issue. Next month the Reports of Association Committees presented at the St. Louis Annual Meeting will appear. In May, Committee Reports of one of the Sections will be published as a unit, in June of another Section, and so on until all have been made available. The Committee Reports will occupy the same place in the JOURNAL each month, immediately following the editorials.

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Laboratory Diagnosis of Rabies—Thomas F. Sellers, M.D., State Board of Health, Atlanta, Ga.
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Meningitis and Meningococcus—Sara E. Branham, M.D., National Institute of Health, Bethesda, Md.
Recognition and Significance of Hemolytic Streptococci in Infectious Diseases—Julia M. Coffey, State Department of Health, Albany, N. Y.
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Serological, Bacteriological and Other Biological Procedures in the Diagnosis of Undulant Fever—A. Parker Hitchens, M.D., University of Pennsylvania, Philadelphia, Pa.
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Studies on the Toxicity of Dyes for Bacteria—Edmund K. Kline, Dr.P.H., Cattaraugus County Department of Health, Olean, N. Y.
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Typhus Fever and Laboratory Methods for Its Recognition—Henry Welch, Ph.D., Food and Drug Administration, Washington, D. C.
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Laboratory Methods for the Diagnosis of Fungus Diseases—Lois Almon, Ph.D., State Laboratory of Hygiene, Madison, Wis.

Studies on the Toxicity of Dyes for Bacteria—Cassandra Ritter, Water Laboratory, University of Kansas, Lawrence, Kans.

Tuberculosis and Tubercle Bacillus—M. H. Brown, M.D., University of Toronto, Toronto, Ont.

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Chemical Methods of Sewage—F. Wellington Gilcreas, State Department of Health, Albany, N. Y.

Coliform Group Variants—Leland W. Parr, Ph.D., George Washington University, Washington, D. C.

Methods for the Determination of Iodine—John T. Tripp, Ph.D., State Department of Health, Lansing, Mich.

Microscopic Methods of Water—Theodore A. Olson, 3010 Redick, Omaha, Neb.

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Comparative Tests of Agar Media for Standard Milk Work—S. R. Damon, Ph.D., State Board of Health, Montgomery, Ala.

Coördination of Milk Ordinance and Laboratory Work—A. W. Fuchs, C.E., 5420 Connecticut Avenue, Washington, D. C.

Laboratory Equipment — Raymond V. Stone, D.V.M., 808 North Spring Street, Los Angeles, Calif.

Methods for Detecting Organisms of the Coliform Group—A. J. Slack, M.D., Institute of Public Health, London, Ont.

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BOOKS AND REPORTS

Trichinosis Problem in California—*Report of a Survey, 1940–1941—K. B. Kerr, Sc.D., State of California Department of Public Health in Cooperation with the U. S. Public Health Service,* 1942. 37 pp.

This pamphlet presents information on the sources of hogs slaughtered in California, the incidence of trichinosis in these hogs, the character of the food which was fed to them, the type of trichinous pork products and their degree of infection, percentage of cases of human trichinosis, and the reported sources of infection of human cases in California. As in surveys previously made in other states, this survey demonstrates the high incidence of trichinosis in garbage-fed hogs (6.4 per cent or 50 per cent of all trichinous pork sold in California). Fresh sausage was the most usual pork product infected, but one sampling of pork chops was found with live trichinae. Cooking of garbage from municipalities before feeding to swine is recommended as a corrective. The report is documented with eleven tables, two maps, and one chart, and has nineteen bibliographic references.

ERNEST CARROLL FAUST

Rockefeller Foundation, International Health Division—Annual Report, 1941—*New York (49 West 49th Street),* 1942. 224 pp.

To a large extent this report of the International Health Division is a well considered review of the prospects which the future holds for public health. It should be informative to workers in our field to learn where the areas of great potential discovery seem to lie. These reports of studies in yellow fever, influenza, rabies, virus studies, typhus fever, malaria, syphilis, tuberculosis, diphtheria, mental hygiene, and nutrition show something of the breadth of the field and indicate where there is hope for more light. Once again the report represents more than an account of stewardship. It is a source of factual information rivalling in its range any other abstracts of research conducted around the world. Presented here in succinct form, it is well worth the thoughtful reading of everyone who wishes to be abreast of the developing science of hygiene.

Of the total of $72,565,000 spent by the Foundation for public health since 1913, $18,519,000 has been spent for the control and investigation of specific diseases and deficiencies; $6,782,000 for aiding state and local health services; and $6,469,000 for the education of health workers. Buildings, equipment and endowment given for public health represent more than $22,000,000. Never before in the history of the world has there been such an outpouring of generous help and good will. To a large extent this organization has set the pattern for the more liberal grants now being made by governments in many countries. Without such preparation as this during the last 30 years it would be impossible now to find the human resources to operate the present expanded programs. The public health professions are deeply in debt to the Rockefeller Foundation. REGINALD M. ATWATER

Heredity, Food, and Environment in the Nutrition of Infants and Children—*By George Dow Scott. Boston: Chapman and Grimes,* 1942. 778 pp. Price, $5.00.

Another "nutrition" book has been written. The first three hundred-odd pages discuss in a reminiscent and

rambling way such matters as heredity, mating, cells, disease, and diagnosis, among other topics. The sections on genetics have been quite ably scoffed at by another reviewer (*J. Heredity*, Sept., 1942). When Dr. Scott finally gets around to his subject the reader, if he has read that far, can only guess what will come next.

Among examples of what might be called "rambling" are such statements as this one (from p. 321, *Pertinent Facts in Infant Feeding*): "Could science in the *past* have controlled *preceding* generations by modern medical methods, fewer dysfunctions from parental syphilis and from other toxins might have been transmitted, fewer alcoholic or sexual excesses might have occurred to darken the lives of so many succeeding little innocent children." (Italics ours.) Or take this one (from p. 323): "Food, plant, and metal poisons in *lethal doses may counteract* beneficial tendencies (to cure of nutritional diseases)." (Italics ours!) By now the reader will have concluded that the author is a master of the qualified statement.

In the remaining 450 pages, 130 are devoted to what is called "Physical and Psychic Stimuli," including such matters as massage, hydrotherapy, baths, sex attraction, and clothing, four kinds of climate, and music, to name only a few of the diverting topics.

In the chapter headed, "Fruits" there is a 17 page cookbook including a recipe for fish in jelly and one for snert (pig's feet).

The book has no index, but only a table of contents. A bibliography occurs after each chapter and is not alphabetized. CARROLL E. PALMER

First Aid. Surgical and Medical —*By Warren H. Cole, Charles B. Puestow and 17 other medical authorities. New York: Appleton-Century,* 1942. 374 pp. Price, $3.00.

Drs. Cole and Puestow have collaborated with several of their colleagues on the University of Illinois College of Medicine Faculty to produce this very useful book on a timely topic. First Aid, it appears, is the most currently popular subject in the field of health education—more than 4½ million people have taken the standard Red Cross course in the last three years!

The book is primarily directed toward the person with a background of knowledge in the biological sciences, especially medicine. The treatment of topics is sufficiently versatile so that physicians, medical students, and nurses will find it of interest and practical value. Many non-medical public health workers can likewise study it with profit.

The greater part of the text is devoted to emergencies relating to accidents caused by war, although emergencies encountered in peacetime have not been neglected. Coverage of such topics as the emergency treatment of wounds, burns, hemorrhage, and shock is especially clear and to the point. A description of blast shock, a potential civilian hazard in World War II, will bring this subject to the attention of many readers for the first time. Definitive or long-range care is touched upon in discussions of first aid treatment, thus lending further interest to the individual subjects. The use of the sulfonamides is alluded to frequently.

The illustrations, which were produced under the auspices of the medical school's Illustration Studio, are decidedly helpful.

The authors feel that first aid training should be part of the individual's liberal education, a principle with which all health workers will agree.

The book can be heartily recommended to all public health workers regardless of whether they are trained in the medical sciences or not.

MILTON ROSE

Aftereffects of Brain Injuries in War, Their Evaluation and Treatment, the Application of Psychologic Methods in the Clinic—*By Kurt Goldstein. Foreword by D. Denny-Brown. New York: Grune and Stratton,* 1942. 224 pp. Price, $4.00.

During the World War of 1914–1918 a number of hospitals for the study and care of cerebral injuries were set up in Germany. Kurt Goldstein had charge of one of these institutions. As a result of his experiences he realized the necessity for certain technics of examination and methods of training in rehabilitation, which were previously unknown in the clinic. Fortunately, associated with him was an experimental psychologist, A. Gelb, well trained in psychological methods, with whom technics for functional analysis of behavior were developed. Although Goldstein has described these procedures in some detail in German periodicals, they have not been widely read by clinicians to whom they should have a special appeal at the present time.

The book is divided into two sections, the first dealing with symptomatology and the second treatment. In the first part the author presents a sketchy review of the neurological signs and symptoms following head injuries. The mental aberrations are then discussed in greater detail and the methods which may be used to bring out the defects in the higher mental functions are described. This portion of the book is of particular value to the student of the nervous system, who so often is unacquainted with the tools by which mental impairment may be measured and who using malapropos tests concludes erroneously, that the higher mental functions are intact.

In the second half of the book the treatment of these cases is discussed. Although the therapy is presented clearly and based upon sound psychological principles, the individual methods of training are largely outmoded due to the rapid advances in the past decade of radio electronics and cinematography. The concluding chapter discusses the problem of social adjustment, which from the patient's standpoint is of paramount importance. Goldstein's statistics on the rehabilitation of patients suffering from cerebral lesions is interesting. Twenty per cent became practically normal workers, 62 per cent were able to do some type of work but below normal capacity, and 18 per cent were unable to pursue any type of painful occupation.

The book is a clear presentation of the problem of the care and rehabilitation of the cerebrally injured, which should be of interest to psychologists, neurologists, neurosurgeons, psychiatrists, and clinicians in general. The bibliography is a valuable although incomplete list of the publications on this subject with particular emphasis on the German literature.

A. EARL WALKER

Ambassadors in White — *By Charles Morrow Wilson. New York: Henry Holt,* 1942. 372 pp. Price, $3.50.

This is a book for the man in the street who seeks a general impression, a vivid suggestion of the facts without particular concern about the accuracy or refinement of details. It is a journalist's contribution to the new national interest in the 120 millions or so of neighbors below the Rio Grande.

Of the fourteen chapters, half are devoted to a wholly laudable hero-worship of men of various nativities, but all medical disciples, and each worthy of all praise for his practical services to Latin America.

The first two chapters, "Sick Man's Society" and "Past and Present," may well be required tourist reading for post-war sea-going travellers. Our own Puerto Rico should have taught us

continentals of the States the meaning of centuries of neglect by incompetent governments, essential poverty developed by absentee landlordism, and pervading ignorance without the relief of even the most elementary schooling until recently.

Disease in mass is well illustrated by word, by story, by statistics. The answers to the prayer for prevention are known and can be made effective when commerce, government, and the church combine to provide the men of science with the support needed.

Such a title as "Fierce, Deep, Black Mysteries" is heavily charged only for the quite uninformed physician or nurse or health officer of today, being a series of sketches of diseases fortunately not common in temperate zones.

"Damn the Mosquitoes" and "Banana Medicine" are catchy headings and appeal to the reader who has a bit of spare time to refresh his memory of insect and other pests.

A breezy, well illustrated book which, it is hoped, will carry conviction to the reader who sticks too close at home, or makes travelogues his hobby and wants to know more about Central and South America right now.

HAVEN EMERSON

Contraception and Fertility in the Southern Appalachians—*By Gilbert W. Beebe. Baltimore: Williams & Wilkins,* 1942. 274 pp. Price, $2.50.

The most recent definitive analysis of the effect of contraception on group fertility is Mr. Beebe's study of a service established in Logan County, West Virginia in 1936. This service, unlike those designed to serve women who need contraceptive advice for medical reasons, was a frank attempt to reduce fertility in a region of excessive population pressure.

Contraceptive jelly was distributed to women desiring to try it by a public health nurse who made home visits in coal mining camps. The first patients were referred by physicians in the county, who gave the project their whole-hearted approval. Other women, who heard of the service, were glad to avail themselves of it, and at the end of three years about 1,300 women had been enlisted.

Mr. Beebe's book begins with a discussion of the economic and social characteristics of the people in the area and an analysis of their fertility before the service was established. His study of the selective factors operating among women accepting advice constitutes a new and very valuable contribution to the field of study. The collection of data on a random sample of women who refused the service, as well as of those who accepted it, substantiates the long existing "hunch" that women who seek or accept contraception are mainly those who have been unable to control their fertility satisfactorily.

On the basis of this information, Mr. Beebe has been able to measure not only the impact of the service on the fertility of the women accepting contraceptive advice, but also to estimate the total reduction in county fertility achieved by this type of service.

Mr. Beebe is convinced that rural services such as the one studied should be instituted under the supervision of official public health agencies. The final chapter discusses the problems of organization and costs in detail, and should be of special interest to public health administrators.

REGINE K. STIX

Civilian Health in Wartime—*By Francis R. Dieuaide, M.D. Cambridge: Harvard University Press,* 1942. 328 pp. Price, $2.50.

Interesting and informative, this book will be thoroughly enjoyed by professional workers and laymen alike. Public health in its broad aspects is surveyed

and the whole related to present-day health organization. Recently established governmental agencies are noted in relation to the fields of their activities. As the title implies, the impact of war on health receives key consideration, but only after a firm foundation was laid by accurately describing health conditions as they were before the onset of this war. For instance, the health phases of "aging and the aged" are only a part of that important problem, and the author rightly places particular emphasis on how to fit our fathers and mothers into the scheme of living which is changing so rapidly. This type of consideration is characteristic of the treatment of such subjects as "Shelter and Raiment," "Occupation and Recreation," "Mental Calm and Vigor," as well as the more traditional subjects of nutrition, infectious diseases, and maternal and child hygiene.

One unimportant error came to my attention. Endemic typhus was first diagnosed in the United States in 1913 rather than in 1928.

WILTON L. HALVERSON

Medical Parasitology—*By James T. Culbertson. New York: Columbia University Press,* 1942. 250 pp. Price, $4.25.

The author presents, according to his statement, a brief description of the animal parasites and the diseases they cause. The book is divided into two parts. It has an introduction which includes a discussion of the historical aspects of parasites and a definition of terms. Part one is concerned with the general considerations such as infections, epidemiology, natural resistance and acquired immunity, diagnosis, specific therapy, and prophylaxis.

The second section discusses the various parasitic diseases and each parasite is described as to its geographic distribution, morphology, life cycle and cultivation, epidemiology, pathogenicity, immunity, diagnosis, specific therapy, and prophylaxis.

Since the author has discussed the field of parasitic diseases in a book which is confined to 250 pages of text, he of necessity has had to be quite didactic in certain places with regard to the description of some of the parasites especially *Endamoeba histolytica.* Also, in connection with the treatment of amebiasis, the author expresses the opinion that yatren is the drug of choice and that this drug is effective in the treatment of amebic abscess of the liver. He does mention carbarsone as being less extensively employed. At the present time carbarsone, in the opinion of the reviewer, is the drug of choice for the treatment of amebiasis. It should also be stated that no drug given by mouth has proved to be effective for the treatment of liver abscess. No mention is made of diodoquin in the treatment of amebiasis. This drug is reported to be effective in that condition.

In connection with malaria it is stated that sporozoites enter the red blood cells within an hour or so. This is a point that up to the present time has not been determined. The statement is made and it is implied that malaria therapy will cure neurosyphilis. While this is not a book dealing with syphilis, such a statement is misleading since malaria therapy alone is usually not sufficient to cure this disease. Mention is also made of *P. falciparum* for this purpose. In the opinion of the reviewer, *P. falciparum* should never be used for purposes of inducing malaria as a means of treating neurosyphilis. In connection with the use of atabrine in the treatment of malaria, attention should be called to the fact that this agent is not very effective against the gametocytes of *Plasmodium vivax* and *P. malariae.*

In the discussion of immunity in malaria it is said that man loses his acquired immunity and resumes his normal susceptibility when the malaria

parasite is removed from the body. The opinion as to this point is that immunity in malaria is a strain immunity. If an individual has been infected with a certain strain even though the parasite cannot be demonstrated, there is a relative amount of resistance to that strain upon reinfection.

In the discussion of trichuris, in addition to man as a host for this parasite, it should be stated that it is also found in monkeys, dogs, pigs, and other animals. The clinical manifestations associated with this parasite are discussed and while they may be present in some cases of trichuris infestation, they probably would not represent the usual situation.

The filariform larvae of *Strongyloides stercoralis,* are described as unsheathed. Filariform larvae are usually sheathed. In the discussion of the symptoms associated with hookworm infestation " bloody stools " are mentioned. In the experience of the reviewer, this is a most unusual occurrence.

No mention is made of the use of cellophane swab (N.I.H.) in the diagnosis of *Enterobius vermicularis.* This has proved to be the most efficient method of diagnosis of this parasite and has been of great value in studying the epidemiology of enterobiasis.

In a discussion of morphology and life cycle of Ascaris lumbricoides no mention is made of unfertilized ascaris eggs. This form of ascaris egg appears frequently in light ascaries infestations which comprise a reasonable proportion of most of the cases of ascaris.

In discussing the tick, *Amblyomma americanum,* the statement is made that it does not transmit any infectious agent. It is now known that this tick can transmit tularemia and recently it has been demonstrated as a vector of Rocky Mountain spotted fever.

For a book which has been reduced in size and which covers the large amount of material and which is meant for a brief discussion of parasitic diseases, it serves a good purpose. It has sixteen figures and seven tables, the latter are quite valuable in setting forth in tabular form the routes of infection, geographic distribution and treatment of the various parasites. There are twenty-one excellent " bled " plates in the book which are unique in a textbook of this kind. There is also an appendix in which there is described the technical methods for the preparation, preservation, and cultivation of materials. This should prove quite useful for technicians and others responsible for such work.

ALVIN E. KELLER

Report of the Committee on Tuberculosis in War-Time — *Medical Research Council Special Report Series No. 246. New York: British Information Services, 30 Rockefeller Plaza,* 1942. 36 pp. Price, $.25.

This report should be read by every tuberculosis administrator and health officer. It is a concise presentation of the analysis of existing data on tuberculosis mortality in Great Britain and Scotland. It indicates that, between 1939 and 1941, there has been a real increase in tuberculosis deaths in these countries affecting all age groups, children more particularly in recent months, and the older male age groups as well. It is pointed out that there has been some slackening of the rise during the second year of the war, but that the picture is still unfavorable as compared to prewar figures. The committee reports, however, that considering the known course of tuberculosis, further increases must be expected as war conditions continue.

The most acute problem in the present picture is the increased mortality of children from tuberculous meningitis. This is coupled with a serious problem of bovine infection, and the increased danger incident to the large number of adult cases that have

found their way back into the community.

More than half of this report deals with measures for preventing further infection, controlling known cases, and the rehabilitation of known cases. The schemes presented are not new in principle as they are those simple procedures of case finding and supervision which are now well known to all workers in this field. This report, however, has gone further in that it has advocated a broader use of mass radiography than generally practised, and a far more generous financial attitude toward the tuberculous individual and his family during the stage of active treatment and the post-sanatorium period. If we spend large sums to bring a tuberculous case to arrest, we should invest enough to rehabilitate that case to a productive place in society, and this report sees a place in their planning for the chronic case who may have exhausted all known treatment devices without reaching a real arrest of his disease.

This report indicates what may happen in a nation not actually invaded by the enemy, and what should be done about it. It is timely for us in this country for, even though there is no present evidence that there has been a real increase in tuberculosis death rates, the threat is a real one that may be altered by the increased demands on the laborer in industry, the rationing of food, and the environmental problems incident to an all-out war effort. We would do well to adopt most of the recommendations of this report in America today.

HERBERT R. EDWARDS

Mental Illness: A Guide for the Family—*By Edith M. Stern. New York: Commonwealth Fund,* 1943. 134 pp. Price, $1.00.

Doctors and nurses who have responsibility for the recognition and care of mental illness will welcome this volume with its practical information and guidance for the family. This very readable book has been prepared under the best auspices and can be recommended as reflecting a wholesome and modern viewpoint.

REGINALD M. ATWATER

Elements of Healthful Living—*By Harold S. Diehl, M.D. New York: McGraw-Hill,* 1942. 295 pp. Price, $1.75.

In 1934, Dr. Fishbein suggested that the author write a book on personal hygiene that would be appropriate for the lay public. The author's experience as a university physician and professor of preventive medicine and public health was reflected in a book which was both factual and readable. Written in simple, direct style, it had a wide popular appeal and was adopted as a textbook by many college teachers. Largely at the request of these teachers, the contents and references were enlarged and the book was reëdited as a college *Textbook of Healthful Living*. This book was also well received, but the recent necessity to "streamline" these courses led to requests for a condensed volume. The new edition is a response to the present-day need for an accelerated college teaching program.

The book is limited almost entirely to a discussion of personal health problems though there is one chapter on community health. Special emphasis is placed upon nutrition, mental health, and the various factors contributing to physical fitness. The chapters on major health problems, modern parenthood, health problems of adult life, and choice of a medical adviser, are particularly appropriate. There is a delightful freedom from physiological discussion.

The author has made an excellent selection of material to be retained in the new book, and in no place has he omitted essential information from the text. The deletion of food value tables

in the appendix of the new edition will disappoint college hygiene students who found this an easy and accurate guide. A section on personal hygiene problems related to tropic and arctic living would have served a useful purpose to young men anticipating military service.

Here is a discussion of personal health problems which will meet with popular approval and which will maintain the popularity of its forerunner as a textbook for high school and college students.

CHARLES E. SHEPARD

BOOKS RECEIVED

MANUAL OF VETERINARY BACTERIOLOGY. By Raymond A. Kelser and Harry W. Schoening. 4th ed. Baltimore: Williams & Wilkins, 1943. 719 pp. Price, $6.50.

FUNDAMENTALS OF IMMUNOLOGY. By William C. Boyd. New York: Interscience Publishers, 1943. 446 pp. Price, $5.50.

FUNDAMENTAL PRINCIPLES OF BACTERIOLOGY. By A. J. Salle. 2d ed. New York: McGraw-Hill, 1943. 643 pp. Price, $4.00.

NOXIOUS GASES AND THE PRINCIPLES OF RESPIRATION INFLUENCING THEIR ACTION. By Yandell Henderson and Howard W. Haggard. 2d ed. New York: Reinhold, 1943. 294 pp. Price, $3.50.

INTRODUCTION TO PSYCHIATRY. By W. Earl Biddle and Mildred van Sickel. Philadelphia: Saunders, 1943. 358 pp. Price, $2.75.

A SURGEON'S FIGHT TO REBUILD MEN. The Autobiography of Dr. Fred H. Albee. New York: Dutton, 1943. 349 pp. Price, $3.50.

THE PASTEURIZATION OF MILK. By G. S. Wilson. New York: Longmans, Green, 1942. 212 pp. Price, $5.00.

FAMILIAL NONREAGINIC FOOD-ALLERGY. By Arthur F. Coca. Springfield: Thomas, 1943. 160 pp. Price, $3.00.

THE SIGHT SAVER. By C. J. Gerling. New York: Harvest House, 1943. 202 pp. Price, $2.00.

RELIGION AND HEALTH. By Seward Hiltner. New York: Macmillan, 1943. 292 pp. Price, $2.50.

HEALTHY BABIES ARE HAPPY BABIES. By Josephine Hemenway Kenyon. 3d ed. Boston: Little, Brown, 1943. 343 pp. Price, $1.50.

MUNICIPALITIES AND THE LAW IN ACTION. 1943 EDITION. CITIES AND THE WAR. National Institute of Municipal Law Officers, Washington, D. C. 611 pp. Price, $7.50.

THE INFECTIOUS DISEASES OF DOMESTIC ANIMALS. By William Arthur Hagan. Ithaca: Comstock, 1943. 665 pp. Price, $6.00.

FOOD VALUE CHARTS. Philadelphia: Philadelphia Child Health Society, 1942. Set of 12 Charts, 50¢.

AN EVALUATION OF DENTAL HEALTH LITERATURE. By Vern D. Irwin and Netta W. Wilson. St. Paul: Bruce, 1942. 58 pp. Price, 50¢.

DEMOCRACY MEANS ALL OF US. HOW COMMUNITIES CAN ORGANIZE TO STUDY AND MEET COMMUNITY NEEDS WITH SPECIAL SUGGESTIONS FOR DEVELOPING NUTRITION PROGRAMS IN WARTIME. Washington: Office of Defense Health and Welfare Services, The Nutrition Division, 1942.

THE COMMONWEALTH FUND, TWENTY-FOURTH ANNUAL REPORT OF THE GENERAL DIRECTOR FOR THE YEAR ENDING SEPTEMBER 30, 1942.

UNDERSTAND YOUR ULCER. By Burrill B. Crohn. New York: Sheridan House, 1943. 199 pp. Price, $2.50.

A STUDY OF PATIENTS DISCHARGED ALIVE FROM TUBERCULOSIS SANATORIA IN 1933. By Jessamine S. Whitney and Mary V. Dempsey. New York: National Tuberculosis Association, 1942. 58 pp.

INTERSTATE SANITATION COMMISSION. Annual Report 1942. 60 Hudson St., New York, N. Y.

VENEREAL DISEASES, DIAGNOSIS, TREATMENT AND LABORATORY METHODS. Compiled by the Medical Committee of the Health League of Canada. Toronto: Canadian Department of Pensions and National Health, 1942. 89 pp.

MEDICAL SERVICES IN INDUSTRY. A Selected, Annotated Bibliography with Particular Reference to Health Programs in War Industries. Price, 10¢.

THE FEEDING OF WAR WORKERS. A Selected, Annotated Bibliography. Price, 25¢.

THE METABOLIC COST OF MAINTAINING A STANDING POSITION. With Special Reference to Body Alignment. By Harriet Graham McCormick. King's Crown Press, 1145 Amsterdam Ave., New York, N. Y. 1942. 75 pp. Price, $1.25.

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

Tomato vs. Vegetable Juices—How much ascorbic acid are you getting in your tomato juice or vegetable juice cocktails? The mixed vegetable juices are likely to be inferior in nutritive value to ordinary tomato juice, and there is quite a whale of difference in various brands of the latter. The table tells all.

ANON. Vegetable Juice Cocktails. J.A.M.A. 121, 4:258 (Jan. 23), 1943.

In Place of the Ancient Cooler and Tin Cup—Being the standard of purity for drinking water adopted by the Public Health Service, for use in Interstate Quarantine Regulations of common carriers, this report should have a permanent place in your files.

ANON. Public Health Service Drinking Water Standards. Pub. Health Rep. 58, 3:69 (Jan. 15), 1943.

Doff Your Cap to This One—Methods by which the State of Pennsylvania went about the control of pneumonia, and the salutary results achieved are told in instructive detail. Read, ponder it, and do likewise—or better—administrator!

BORTZ, E. L. Therapeutics of Pneumonia on a Statewide Basis. J.A.M.A. 121, 2:107 (Jan. 9), 1943.

Melancholy Tale—Though it be true that he who lives by the sword may perish by the sword, it is more likely that he will perish by famine and pestilence. This hopeful note ends a gruesome but erudite discussion of the parts played by hunger and disease in molding world history. Don't miss it.

CANNON, P. R. War, Famine, and Pestilence. Sci. Month. 46, 1:5 (Jan.), 1943.

Onset and Duration of Rheumatic Fever—Useful statistics about rheumatic fever should find a preferred place in your reading list. In this paper: age at which the infection usually begins; and mean duration of life for the different beginning age groups.

COHN, A. E., and LINOG, C. The Natural History of Rheumatic Cardiac Disease: A Statistical Study. J.A.M.A. 121, 1:1 (Jan. 2), 1943.

Tuberculosis on a Dollars and Cents Basis—Tuberculosis surveys should include preselection with the tuberculin test, even in the low income groups. The program should concentrate upon the adult population of low economic or social status, providing a chest x-ray for all over 15 who are on relief, and all new reliefers, and an annual x-ray between the ages of 15 and 25 for all contacts.

EDWARDS, H. R. The Cost of Tuberculosis Control in the Department of Health, New York City, 1940. Milbank Quart. 21, 1:64 (Jan.), 1943.

Vitamins, Synthetic and Natural—Historians will consider the thirties as the decade of great progress in the chemistry of vitamines; let us hope that the forties will prove to be the decade of sensible application of the available knowledge, hopes the writer of this excellent review of our knowledge of vitamin A alcohol, the vitamin D's, l-ascorbic acid, thiamin hydrochloride and so on through the list to biotin, and inositol.

ELVEHJEM, C. A. Recent Advances in Our Knowledge of the Vitamins. Sci. Month. 56, 2:99 (Feb.), 1943.

Yellow Fever Prophylaxis—Vaccination of adults with a potent yellow fever virus results in an immunity that lasts for at least 4 years—within reasonable but variable limits. In children the immunity is neither as complete nor as lasting.

FOX, J. P., and CABRAL, A. S. The Duration of Immunity Following Vaccination with the 17 D Strain of Yellow Fever Virus. Am. J. Hyg. 37, 1:93 (Jan.), 1943.

War-Workers' Midday Meals—Eight valid reasons why it is not an easy matter to improve the diets of industrial workers are discussed in this paper which concludes from reported findings that an active educational campaign is needed by the workers, the employers, and especially the managers of company cafeterias.

GOODHEART, R. Dietary Conditions in Industry. J.A.M.A. 121, 2:93 (Jan. 9), 1943.

The Lame, the Halt, and the Blind—Findings of a survey of government industries to discover jobs that might be filled by the handicapped are to be set forth in a loose-leaf manual to aid in the recruiting, training, and placing of those former unfortunates who, because of a wartime man power shortage, will find a chance to lead useful lives.

HARVEY, V. K., and LUONGO, E. P. The Physically Handicapped in Industrial Establishments of the Government. J.A.M.A. 121, 2:100 (Jan. 9), 1943.

Something New Under the Sun—Though only a few months old, this painless method of childbirth by means of caudal analgesia will soon be a topic for parlor discussion and back fence gossip. Health workers should be ready with the facts here presented.

HINGSON, R. A., and EDWARDS, W. B. Continuous Caudal Analgesia in Obstetrics, (and) GREADY, T. G., and HESSELTINE, H. C. Continuous Caudal Analgesia in Obstetrics. J.A.M.A. 121, 4:225 (Jan. 23), 1943.

Communicability of Leprosy—Even though you may never see a leper, you will be interested in this brief discussion of the epidemiologic aspect of the disease. Imported infection introduced into the Gulf States shows a tendency to spread. Elsewhere in the United States transmission is so rare as to be negligible from a public health standpoint.

MCCOY, G. W. Observations on the Epidemiology of Leprosy. Pub. Health Rep. 57, 51:1935 (Dec. 18), 1942.

Representative Vitamin Values—Vitamin A, thiamin, ascorbic acid, and riboflavin contents of two hundred-odd fresh foods, are set forth in a table, especially useful in the coming days of restricted food supplies.

MUNSELL, H. E. The Vitamin A, Vitamin B (Thiamin), Vitamin C (Ascorbic Acid), and Riboflavin Content of Common Foods. Milbank Quart. 21, 1:102 (Jan.), 1943.

A Comprehensive Civic Attack on Prostitution—Three excellent ways for *not* controlling the spread of venereal diseases by the harassment, medical control, and health departmental supervision of prostitution serve as a striking preamble to a proposal for the repression of prostitution and the custodial care of prostitutes, which would be unquestionably effective if police and courts would coöperate on a permanent basis with health officials—which they can so seldom be depended upon to do.

NELSON, N. A. The Repression of Prostitution for Venereal Disease Control. Baltimore Health News. 20, 1:101 (Jan.), 1943.

To Be Taken Without Grain of Salt—Four down-to-earth papers concerned chiefly with syphilis case-holding and contact-tracing by public health nurses have much in them of interest

to all health workers—if only to convince the skeptical ones that sources of venereal infection really are being traced.

PEARCE, D. Major Public Health Battlefront (and three related papers). Pub. Health Nurs. 35, 1:8 (Jan.), 1943.

Shipyard Eye—You will want to be informed about the findings of this New York study of our newest communicable disease. Prompt diagnosis, meticulous cleanliness and disinfection, strict isolation, and observation of contacts should be helpful in controlling it.

SANDERS, M., *et al.* Epidemic Keratoconjunctivitis. J.A.M.A. 121, 4:250 (Jan. 23), 1943.

Trichinae in Your Diaphragm—Once an outstanding health educator, now a publicist, this writer challenges health officials (in *the* health magazine for the laity) to answer the question: why don't you prevent by legislation the feeding of raw garbage to swine? There is no other way, seemingly, to stop infestation with trichinae which about one in every 6 of us picks up at some time or other.

SHELLEY, M. D. Why Don't We Trim Trichinosis? Hygeia. 20, 12:898 (Dec.), 1942.

Twenty-Five Years at Altro—Sheltered workshops have a useful place in any scheme for the rehabilitation of the tuberculous. As a health worker (especially in wartime) you should be interested in all phases of the rehabilitation of the tuberculous patient; so you will be helped by reading this account of the Altro workshops.

SILTZBACK, L. E. The Sheltered Workshop in the Rehabilitation of the Tuberculous. Milbank Quart. 21, 1:80 (Jan.), 1943.

After Three Years' Experience—Food handlers examinations are not outstandingly productive in venereal case finding, and cases found are not much of a menace as food handlers (it would cost $164 for each case of syphilis discovered by this method). Though there is more danger of transmitting tuberculosis through food, that menace is not very great either (it would cost $503 for each active case so found). As a means of finding typhoid, the method is practically barren of results. The most complete examination could not prevent the spread of acute infections.

SWARTOUT, H. O., and DIERKER, H. Food Handlers' Examinations. Weekly Bull. California State Dept. of Public Health. 21, 49:193 (Dec. 26), 1942.

Competence of the Aged a Matter of Nutrition—Elderly people should start the day with a good breakfast which should include some protein. Refined carbohydrates and fat should be used sparingly. Tea, coffee, and alcohol are useful stimulants. In old age, hunger is less acute and vitamin storage begins to fail, hence added vitamins and minerals are indicated. These abridged morsels are spread before you to tempt you to read this useful paper. You may be old yourself some day—you know!

TUOHY, E. L. Feeding the Aged. J.A.M.A. 121, 1:42 (Jan. 2), 1943.

ASSOCIATION NEWS

APPLICANTS FOR MEMBERSHIP

The following individuals have applied for membership in the Association. They have requested affiliation with the sections indicated.

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Lawrence Paris, D.D.S., Quoddy Village, Me., Dental Officer, Quoddy Project, National Youth Administration

Byron S. Proper, 17 Battery Place, c/o R. S. Stokvis & Sons, Inc., New York, N. Y., Technical Engineer

George A. Shipman, M.D., 892 Myrtle St., N.E., Atlanta, Ga., Asst. Surgeon (R), U. S. Public Health Service; Industrial Hygiene Physician, State Dept. of Public Health

DECEASED MEMBER

James E. Ives, Ph.D., Washington, D. C., Elected Member 1932—Industrial Hygiene Section

MERIT SYSTEM

Dorothy Adkins, of the Social Security Board, Washington, D. C., has been added to the staff of the Merit System Study to serve as part-time consultant in the field of tests and measurements.

Lillian Dick Long, Ph.D., formerly of Miss Adkins's staff on the Social Security Board, will serve as Test Technician. Dr. Long has been Instructor in Psychology at Sarah Lawrence College and has been connected with the Office of War Information in New York, N. Y.

EMPLOYMENT SERVICE

The Association Employment Service seeks to bring to the attention of appointing officers the names of qualified public health personnel and to act as a clearinghouse on employment. This is a service of the Association conducted without expense to the employer or employee.

From the registry of persons available, selected announcements are published from time to time. Appointing officers may obtain lists of all registrants on request.

Address all correspondence to the Employment Service, American Public Health Association, 1790 Broadway, New York, N. Y.

POSITIONS AVAILABLE

U. S. CIVIL SERVICE COMMISSION. Public Health Nursing Consultants, 5 grades. See November *American Journal of Public Health*, or write U. S. Public Health Service, Washington, D. C.

Merit System Council, Oregon State Board of Health and Crippled Children's Division, has announced merit examinations in practically all public health fields. See November *American Journal of Public Health*, or write H. J. Sears, Merit System Supervisor, P. O. Box 88, Portland, Ore.

Indiana State Personnel Division announces that applications may be filed for positions in orthopedic nursing, medical positions (5 classes), and local public health director. See November *American Journal of Public Health*, or write Indiana State Personnel Division, 141 South Meridian Street, Indianapolis, Ind.

Physician, man or woman, as director of Division of Maternal, Child and School Hygiene in southern city department of health. Woman physician with pediatric training preferred, public health experience not essential. To operate prenatal, infant and preschool clinics and promote school health program. Salary commensurate with ability and qualifications of applicant. Apply **Box J**, Employment Service, A.P.H.A.

Southern state department of health seeks several obstetric and pediatric consultants, requiring a minimum of a year's residency in a specialty, immunity to draft and preferably training in public health. Men and women are eligible. Salary $300 per month plus travel. Apply **Box C**, Employment Service, A.P.H.A.

Public Health Engineer and director of Division of Sanitation of a city and county health unit; population 145,000 in the Midwest. Salary $3,180 and travel allowance. **Box E**, Employment Service, A.P.H.A.

The Flint Civil Service Commission will consider applications for Executive Health Officer of the Flint Department of Health. Applicants must be medical graduates with a valid license to practise medicine in Michigan or eligibility for such license; also must have practised medicine and surgery for five or more years and had considerable experience in public health work. There will be no written test, qualifications being judged solely from review of experience, education and training and an oral examination. Present incumbent is on military leave of absence under circumstances which will probably extend for a period of five years. Staff consists of over fifty professional and technically trained employees. Probable salary $5,400. Inquiries should be directed to Foster B. Roser, Director, Flint Civil Service Commission, City Hall, Flint, Mich.

MEDICAL OFFICERS NEEDED—TENNESSEE VALLEY AUTHORITY

The Tennessee Valley Authority is in urgent need of medical officers who are not eligible for military service and who are willing to accept assignments to war industrial activities (construction, manufacture of war chemicals and manufacture of hydroelectric power) as their participation in the all out war effort. Responsibilities include physical examinations, industrial hygiene, care of injuries, medical care to families in remote construction areas and general public health responsibilities in construction camps and villages.

Salary ranges from $3,200 to $4,200 per annum with opportunity for promotion.

For further information write to Dr. E. L. Bishop, Director of Health, Tennessee Valley Authority, Chattanooga, Tenn., or to the Personnel Department, Tennessee Valley Authority, Knoxville, Tenn.

Public Health nurses wanted for two-county unit in Michigan. Must be graduates with a minimum of 4 months' public health training or 8 months' training under supervision. Salary $1,800 per year with travel allowance $35 to $41 per month. Must drive and own a car. Address Dr. Koupal, Director, Alger-Schoolcraft Health Dept., Manistique, Mich.

CAREER OPPORTUNITIES IN PENNSYLVANIA

Charles B. Frasher, Merit System Supervisor, Pennsylvania State Department of Health, 207 Blackstone Building, Harrisburg, announces that appointments will soon be made in the following branches

of the State Health Department of Pennsylvania: Health Conservation, Tuberculosis Control, Venereal Disease Control, Pneumonia Control, Industrial Hygiene, Narcotic Drug Control, Environmental Hygiene, Public Health Laboratories, Maternal and Child Health Services, Crippled Children's Services, School Medical Inspection, Dental, Nutrition, Milk Sanitation, Public Health Education, Sanitary Engineering, Vital Statistics, Public Health Nursing, Accounts, Biologicals and Supplies, Merit System, Tuberculosis Sanatoria. Open competitive examinations will be held and the resulting lists are expected to be in existence for 2 years or longer. Residence requirements are waived for professional positions.

INDUSTRIAL HYGIENISTS

The Research Section of the Division of Industrial Hygiene, National Institute of Health, Bethesda, Md., needs chemists, physicists, and medical technicians, as well as laboratory assistants in these fields. There is also opportunity for persons without college education, specific training or experience who are interested in such positions. Women now form one-third of the employees in the Research Section.

Wanted: School Dental Supervisor to administer and operate dental program in City schools and clinics in City 50,000 population. Salary $3,000 to $3,600 with travel allowance. Those interested should address Dr. W. A. Browne, City Health Department, Alexandria, Va.

Wanted: Chemist and Bacteriologist experienced in the food field for position as director of laboratory operated by national association. Preference given to man familiar with soft drink industry and capable of addressing meetings and writing for publication. Apply in writing giving brief history, references, salary, and draft status. Address American Bottlers of Carbonated Beverages, 1128 Sixteenth St., N.W., Washington, D. C.

The Milwaukee City Service Commission announces an examination for assistant chief in charge of sanitary inspection. Salary first year $210 per month increasing by $10 increments annually until a maximum of $260 per month is reached. Applicants must be citizens of the United States, between 25 and 45 years of age. Those interested may communicate with the Milwaukee City Service Commission, Room 716, City Hall, Milwaukee, Wis.

FOR OTHER POSITIONS AVAILABLE WRITE EMPLOYMENT SERVICE, AMERICAN PUBLIC HEALTH ASSOCIATION, 1790 BROADWAY, NEW YORK, N. Y.

In view of the current active demand for trained and experienced persons in public health it is suggested that prospective employers communicate directly with the Employment Service, American Public Health Association, 1790 Broadway, New York, N. Y., for up-to-date lists of applicants.

POSITIONS WANTED

M.D., Dr.P.H., interested mental and industrial hygiene, chief of mental hygiene clinic, on staff of psychiatric hospital, speaker, writer, author of books on health, diplomate in psychiatry, professor of psychiatry. Ineligible for military service because of age, healthy, vigorous, able to work hard, now in private practice; would make sacrifice and accept decent but lower remuneration than present income if he could be employed in war industry, preferably New York, New Jersey, or Connecticut. United States citizen. Had important government job in last war. Speaks and writes several languages. **A-504.**

Milk sanitarian open for position July 1, 1943. Fifteen years' experience administering and enforcing milk sanitation laws and regulations in midwestern state. References. **M-500.**

Bacteriologist, 28, Iowa State College, draft immune, 3 years' experience public health laboratory. Experience in investigation and control activities on water, sewage and sanitation, as chemist and bacteriologist and serologist in syphilis and enteric diseases. **L-465.**

NEWS FROM THE FIELD

URBAN REDEVELOPMENT FIELD STATION ESTABLISHED AT M.I.T.

The Massachusetts Institute of Technology announced recently the setting up by its City Planning Division of an Urban Redevelopment Field Station with funds granted for the purpose by the Albert Farwell Bemis Foundation. Associated in the direction of the Field Station's research program are Professor Frederick J. Adams, head of Technology's City Planning Division, Philip H. Cornick of the Institute of Public Administration, New York, N. Y., and Edwin H. Spengler, Associate Professor of Economics at Brooklyn College and consultant to the National Resources Planning Board. Coöperating agencies include the City Planning Board of Boston, Mass., which has made available to the research group its excellent file of data on physical, economic, and social conditions in Boston, and the American Public Health Association's Committee on the Hygiene of Housing, of which Dr. C.-E. A. Winslow of Yale University is chairman.

One of the important problems now being studied by the Field Station is that of the rehabilitation of urban residential areas where the existing buildings are in sound structural and sanitary condition but where the neighborhood pattern is obsolete. Careful estimates are being prepared of both the capital and operating costs of bringing the environmental conditions in such areas up to a standard in line with modern needs and habits of living, particularly in respect to the planning of the local street system and the adequacy of parks, playgrounds, and other community facilities.

In addition to the municipal costs involved in such a program, studies are also being made of changes in the fiscal or administrative policies of the local government which might be necessary or desirable if such a program were to be carried out on a city-wide basis, particularly as they might relate to increases in the percentage of tax exempt property and in the costs of maintenance and supervision for a greatly augmented program of neighborhood recreation.

Various proposals for a post-war program of urban reconstruction have been put forward by public and private agencies and it is probable that some scheme involving the participation of federal and local authorities in coöperation with private interests will be adopted as a reëmployment measure when men and materials are again available.

The purpose of the Field Station is to analyze various methods of urban redevelopment which are now receiving consideration with the object of determining their relative value in terms of present-day social and economic conditions.

MEDICAL AND HEALTH STAFF, AMERICAN RED CROSS

The American Red Cross has recently announced the Medical and Health staff as follows:

Albert McCown, M.D., Dr.P.H., Medical Director, National Headquarters, Washington, D. C.

Amos Christie, M.D., Assistant Medical Director, National Headquarters, Washington, D. C.

John F. Busch, M.D., Medical Director, Eastern Area, Alexandria, Va.

H. E. Kleinschmidt, M.D., Medical Director, North Atlantic Area, New York, N. Y.

G. Foard McGinnes, M.D., Dr.P.H., Medical Director, Midwestern Area, St. Louis, Mo.

Milton Rose, M.D., Dr.P.H., Medical Director, Pacific Area, San Francisco, Calif.

EMPLOYMENT OF YOUTH UNDER 18 YEARS OF AGE—POLICY OF THE WAR MANPOWER COMMISSION

To promote proper utilization of the labor resources of youth with due regard to the welfare of youth and the future needs of the nation, the War Manpower Commission, on January 30, 1943, declared as basic national policy that:

1. School attendance laws and child-labor standards embodied in State and Federal laws be preserved and enforced, and the minimum standard hereinafter listed not be construed to warrant any relaxation of these laws or lowering of the standards embodied in them;

2. No one under 14 years of age be employed full-time or part-time as a part of the hired labor force;

3. Youth under 18 years of age be employed only: after obtainment of proof of age; in work suited to their age and strength; where provision is made for adequate meal and rest periods, sanitary facilities, and safeguards for health and safety; for periods suited to their age and strength, and in no case for more than 8 hours a day or 6 consecutive days, with certain exceptions; during hours of day not detrimental to their health and welfare; and at wages paid adult workers for similar job performance;

4. Youth aged 14 or 15 be employed only when, in addition to the foregoing conditions; qualified older workers are not available; and the employment is not in manufacturing or mining occupations;

5. In-school youth be employed only to the extent that the combined school and work activities involve no undue strain, and that combined school and work hours, at least for youth under 16, not exceed 8 a day;

6. In-school youth not be employed during school hours unless the Area or Regional Manpower Director has determined that temporary needs of an emergency character cannot be met by full use of other available sources of labor, in which case school programs shall be adjusted under plans that provide for the educational progress of those who take employment; avoid interference with the school attendance of those who do not take employment; and avoid the closing of any school or grades therein.

7. In war-time emergency coöperative arrangements between school authorities and employers, the employer to certify to the school authorities that employment will be in conformity with State and Federal laws and with the standards contained in Sections 3 to 7 above, and the school authorities be responsible for permitting school children to take only those jobs that will contribute definitely to their educational welfare and useful work experience;

8. When young people must be transported to and from work, safe and adequate means of transportation be provided, and the period of work and transportation not exceed 10 hours a day;

9. Where youth under 18 years of age are recruited in groups for agricultural work requiring them to live away from home, prior to placement, assurances be furnished by appropriate community or other agencies that suitable living conditions, sanitary facilities, health protection, supervision, and leisure-time activities will be provided; and in no case youth aged 14 or 15 be recruited for work away from home except where such work is in connection with programs conducted by recognized youth-serving agencies;

10. Any youth interested in work in another area not leave his own area in search of work without first registering for employment locally with the United States Employment Service or another agency designated by the War Manpower Commission; presenting evidence of parental consent; and being referred by such office to a specific job opening where he can be lawfully employed, and where there are suitable arrangements for housing.

RESPONSIBILITY FOR AUXILIARY HOSPITAL WORKERS

Dr. James A. Crabtree, Executive Secretary of the Health and Medical Committee of the Office of Defense Health and Welfare Services, has announced that it has been decided that it is neither desirable nor practical for the federal government to foster a training program for hospital auxiliary workers. He said that it was felt the problem was entirely local. Some professional groups have contended that the federal government should assume at least partial responsibility for training, placing, and subsidizing auxiliary workers in hospitals, but over a period of months all angles of the proposal have been weighed and the conclusion as announced has been reached.

AWARD TO DR. C. G. KING

The Pittsburgh Section of the American Chemical Society on February 18 awarded to Charles Glenn King, Ph.D., the 1942 Pittsburgh Award "in recognition of Dr. King's outstanding service to chemistry, particularly through his meritorious research and teaching in biochemistry and nutrition." Dr. King is Scientific Director of the Nutrition Foundation, New York, N. Y., and a former resident of Pittsburgh and member of the faculty of the University of Pittsburgh.

INTERPRETATION OF WAR MANPOWER COMMISSION ORDER CONCERNING TRANSFER TO ESSENTIAL INDUSTRY

The *Journal* is informed, through a statement approved by the War Manpower Commission, that individual interpretations of the recent order regarding the transfer of men within draft age to essential occupations have brought apprehension to hospital and health authorities. There is widespread belief among hospital administrators and health officials, it is stated, that the institutions which they represent are not considered essential by the officials of the War Manpower Commission, whereas the contrary is true.

The statement reads in part:

"Several months ago the War Manpower Commission issued a list of Essential Activities, this list to serve as a basis for overall manpower policy, including that of Selective Service. This list of essential services includes 35 broad groups of activities, one of which is titled 'Health and Welfare Services' and includes the following: 'Offices of physicians, surgeons, dentists, oculists, osteopaths, podiatrists, and veterinarians; medical and dental laboratories; hospitals; nursing services; institutional care; auxiliary civilian welfare services to the armed forces; welfare services to civilians.'"

A list of non-deferrable activities and occupations has also been issued through Selective Service designating certain activities in which all occupations are considered non-deferrable and therefore nonessential. It further designates certain occupations, such as elevator operator, ground keeper, porter and waiter, found in hospitals, health organizations and in nearly all other "Essential Activities," as non-deferrable.

The statement concludes:

"The status of a hospital employee in relation to Selective Service is in no way altered merely by his transfer to some other essential activity, such as aircraft or ordnance production. His status is changed only when he transfers from non-deferrable to a deferrable occupation.

"In summary then, except for the non-deferrable occupations, the position of employees of hospitals and other health services in relation to Selective Service liability is exactly the same as it was before the recent order of the War Manpower Commission."

DR. HARPER RETIRES AS WISCONSIN HEALTH OFFICER

The retirement of C. A. Harper, M.D., as State Health Officer of Wisconsin was announced in January. Dr. Harper has reached the age of 79 and has been health officer continuously for 39 years, which is said to be a record in such a position in the United States. According to the press, Dr. Harper announced that he had resigned because of less vigorous health and because of a desire to be relieved of some of the details of his position. He will continue in the department as medical specialist in public health. Dr. Harper continues as a member of the Board of Health to which he was first appointed in 1901.

Dr. Harper is a native of Wisconsin, having been born in 1864. He was graduated from the University of Wisconsin in 1889, and received his degree in medicine from George Washington University in 1893. After 10 years of practice in Madison he became State Health Officer in 1904. He was awarded an honorary degree of Doctor of Science by Lawrence College in 1941.

NEW QUOTA FOR NURSES IN TRAINING

According to Paul V. McNutt, Federal Security Administrator, 65,000 young women must enter schools of nursing in the year beginning July 1, 1943, if even the minimum civilian and military needs of the nation are to be met. This exceeds the current quota by 10,000, according to the recommendations of the Subcommittees on Nursing and Hospitals of the Health and Medical Committee, Office of Defense Health and Welfare Services.

Where state nurse registration laws permit, schools of nursing are being urged to contribute to the war effort by accelerating their courses to reduce the usual training period from 3 years to 30 months, and in some instances even a shorter time. In most cases, a college degree subtracts 9 months from the course.

Pointing out that a career woman finds good opportunity in nursing, Alma C. Haupt, R.N., Executive Secretary of the Subcommittee on Nursing, said that she might pursue administration, education, public health, industrial nursing, or any one of a number of hospital specialties.

Federal and private scholarships for nursing education are available. Details regarding these and all phases of student entrance requirements may be secured from the National Committee on Recruitment of Student Nurses, 1790 Broadway, New York, N. Y. Entrance requirements in schools of nursing vary, but in general the following are basic qualifications demanded of an entrant: She must be between 18 and 35 years old, be physically fit, have at least a high school education, and may be either married or single.

RECRUITMENT OF NURSES

New staff appointments to meet more effectively the nation-wide shortage of nurses have been announced by the National Nursing Council for War Service, which represents the major professional nursing organizations.

Estelle Massey Riddle, formerly Director of the Homer G. Phillips Hospital School of Nursing, St. Louis, Mo., will be consultant on Negro nursing in relation to the war effort. Among her responsibilities will be assistance in recruiting student nurses, counseling with schools of nursing on ways to increase their resources, and recruitment of graduate nurses for military and civilian services. Mrs. Riddle is a graduate of Columbia University and has served on the staff of the Julius Rosenwald Foundation.

Edith H. Smith, formerly Director of the Leland Stanford University School of Nursing and until recently nursing consultant to the Health and Medical Committee of the Office of Defense Health and Welfare Services, will be college recruitment representative, visiting colleges in the eastern states to present the opportunities in nursing before undergraduates, deans, and vocational counselors.

Another new project, that of field service, will soon be set up with the aim of assisting schools of nursing to accelerate their basic course and to make up any deficiencies which might prevent their graduates from being eligible for service with the armed forces through the American Red Cross Nursing Service.

MISS DEUTSCH JOINS PAN AMERICAN SANITARY BUREAU STAFF

The appointment of Naomi Deutsch, R.N., to the Nursing Staff of the Pan American Sanitary Bureau has been announced. Miss Deutsch will assist the Bureau in South and Central American countries in public health nursing, nursing education, and hospital nursing. Since 1935 Miss Deutsch has been Director of Public Health Nursing for the Children's Bureau, Washington, D. C.

U. S. PUBLIC HEALTH SERVICE FELLOWSHIPS IN HEALTH EDUCATION

The Surgeon General of the U. S. Public Health Service has announced that 20 fellowships providing $100 per month for 12 months, plus tuition, have been made available through a grant from the W. K. Kellogg Foundation for training at the University of North Carolina leading to a Master's degree in public health.

Pointing out that there is a current need for qualified persons with a thorough understanding of both education and public health, Dr. E. R. Coffey, Assistant Surgeon General in charge of the Division of Sanitary Reports and Statistics, indicates that these stipends will provide for a year's training, 9 months being intramural work and 3 months supervised field experience and he also anticipates employment following successful completion of basic training.

"A candidate for the position of health educator should have not only sound scientific training but good personal health and a pleasing appearance. There is great need for the health educator to have creative ability, leadership qualities, sound judgment, common sense, and adaptability. Since the success of the person in this field depends upon the latter qualifications as well as upon academic achievement, the awarding of the fellowships will be made accordingly.

"In view of the fact that the field of community health education is new, standardized and specific training as a qualification for the fellowships could not be fairly requested. However, it is considered pertinent and important if the candidate is able to present a background including some or all of the following areas of knowledge and skill:

"1. Basic cultural education, including the development of appreciations and skills in the use of the English language.

"2. Basic science education including physics, chemistry, biology, physiology and bacteriology.

"3. Training in education and educational psychology.

"4. Social science education to provide an appreciation of the importance of respect for human personality and government."

The training will begin at Chapel Hill, N. C., March 20, 1943. The summer quarter will be spent in the field. Training ends in March, 1944. Fellowships are open to American citizens between the ages of 19 and 40 inclusive. Minimum educational qualifications include a Bachelor of Science degree, or its equivalent, with major emphasis on basic health and medical sciences, education and the social sciences. Persons interested should apply to the Surgeon General, U. S. Public Health Service, Washington, D. C.

U. S. PUBLIC HEALTH SERVICE DRINKING WATER STANDARDS

The standards of purity for drinking water recommended by the Advisory Committee on Revision of the 1925 Drinking Water Standards, appointed by the Surgeon General in February, 1941, have been printed in the January 15, 1943, issue of *Public Health Reports*, Volume 58, No. 3. Reprints are available from the Superintendent of Documents, Washington, D. C., at 10¢ per copy. *Reprint 2440* should be specified in ordering.

The *Journal of the American Water Works Association* reproduces the drinking water standards in its January, 1943, issue. Reprints will not be available from the American Water Works Association.

OFFICERS OF THE SOUTHERN BRANCH, A.P.H.A.

The Secretary of the Association's Southern Branch announces the officers for 1942–1943 as follows:

President, C. F. McClintic, M.D., Charleston, W.Va.
1st Vice President, E. C. Hooper, M.D., Richmond, Va.
2nd Vice President, H. J. Darcey, Oklahoma City, Okla.
3rd Vice President, Donna Pearce, R.N., Washington, D. C.
Secretary-Treasurer, R. H. Hutcheson, M.D., Nashville, Tenn.

COMING VISIT OF BRISTOL, ENGLAND, MEDICAL OFFICER OF HEALTH

On the invitation of the American Public Health Association and the Public Health Association of New York City, British Information Services have announced that Dr. Robert Hughes Parry, Medical Officer of Health of Bristol, England, is expected to be in the United States during March and April and available for public addresses bearing on relationships between public health and the war effort.

Dr. Parry, who was born in 1895, is a graduate of the University of London and has served in experimental pathology in the Bristol Cancer Hospital and as School Medical Officer in Bristol for a number of years. He is professor of preventive medicine at the University of Bristol, and Health Officer of the Port as well as of the city.

It is suggested that state public health associations and other groups consider whether their state programs would permit the appearance of Dr. Parry, whose schedule is being prepared. Those interested should communicate with the Executive Secretary of the Association, 1790 Broadway, New York, N. Y.

EPIDEMIC CEREBRROSPINAL FEVER

For the first time since 1929 the reported incidence of cerebrospinal fever during 1942 approached epidemic status. During the year 1942 there were 32 cases reported, with 9 deaths. This was in contrast to the preceding 4 years when the average of reported cases per year was 6. The last major epidemic in San Francisco was in 1929 when there were 88 cases reported with 81 deaths. The history of cerebrospinal fever has indicated that there are periods of high incidence recurring at fairly long intervals.

Increased reporting continues into 1943. During the month of January there were 16 cases reported to the Department of Public Health, of which 2 were listed as non-local. Among the 16 cases there were 2 deaths. Twelve of the cases were males and 4 females. The age incidence showed that 4 were in the group under 5 years, 5 in the group 5 to 20 years, 6 over 20 years, and 1 on which the age was not stated. Fifteen of the cases were treated in hospitals and 1 case was treated at home. As to occupation, 5 of the cases were listed as in the armed forces and 4 reported as shipyard workers.

At the time of this reporting in February the increased incidence appears to be continuing.

PRIZE AWARD FOR RESEARCH ON ALCOHOLISM

The Research Council on Problems of Alcohol, an affiliated body of the American Association for the Advancement of Science, has announced an award of $1,000 which will be available for outstanding research on alcoholism during 1943, and which is open to any scientist in the United States, Canada, or Latin America. The research for which the award will be granted must contribute new knowledge in some branch of medicine, biology, or sociology important to the understanding, prevention, or treatment of alcoholism. The Committee of Award will consist of a representative of the American Association for the Advancement of Science and four representatives of the Scientific Committee of the Research Council on Problems of Alcohol. Those interested may communicate with Harry H. Moore, Ph.D., Director of the Council, Bronxville, N. Y.

THE KENNY METHOD

Instruction in the Kenny Method for physicians and nurses will be started at an early date at New York University. Information relative to these courses may be secured from Dr. George Deaver, Educational Building, New York University.

DR. CALDERONE APPOINTED DEPUTY COMMISSIONER IN NEW YORK CITY

Ernest L. Stebbins, M.D., Health Commissioner of New York City, has announced the appointment of Frank A. Calderone, M.D., as Deputy Health Commissioner. He succeeds George T. Palmer, Dr.P.H., who resigned to become the A.P.H.A. Associate Field Director.

Dr. Calderone, who is a graduate of New York University Medical College and received his Public Health Degree from Johns Hopkins University's School of Hygiene in 1937, entered the public health field as Epidemiologist for the New York State Health Department. In 1938 he was appointed District Health Officer of the Lower East Side in New York City, and has been Secretary of the Department since July, 1942. In 1940 Dr. Calderone organized the Mothers Health Organization of the Lower East Side which aroused national interest for its method of enlisting groups of mothers through various community organizations under natural key leaders, and which successfully carried on its own nutrition program. He has been Assistant Professor of Preventive Medicine at New York University. He is a member of the Diphtheria Subcommittee of the Committee on Administrative Practice of the A.P.H.A.

"CURRENT MORTALITY ANALYSIS"

J. C. Capt, Director of the Bureau of the Census, Department of Commerce, Washington, D. C., has announced the publication of Volume 1, No. 1, of *Current Mortality Analysis*, a new publication of the Census Bureau based on the returns of a 10 per cent sample of death certificates received at vital statistics offices. Mr. Capt has announced that, because of the importance in these times of obtaining all information on public health conditions as promptly as possible, the Bureau of the Census has revised its procedure so that certain statistics of national mortality can be obtained many months in advance of the time they were previously available.

The new publication is expected to appear each month approximately 7 weeks after the close of the month in which the deaths occurred. It is especially designed for a limited distribution among persons whose work requires that they keep abreast of public health trends in the United States during the war. It is believed that through this publication public health officials, vital statisticians, epidemiologists, and others concerned with the conservation of man power and the war production program will be able to keep themselves aware of the effect of changes that are taking place in the health environment of the population in various regions of the country. The Census Bureau will honor requests from persons who wish to receive the publication without cost, provided the full title and mailing address are given.

COLONEL RUSSELL TO GIVE BIGGS MEMORIAL LECTURE

The Committee on Public Health Relations of the New York Academy of Medicine has announced that the Hermann M. Biggs Memorial Lecture will be given in Hosack Hall at the New York Academy of Medicine on April 1, at 8:30 P.M. by Lt. Colonel Paul F. Russell of the Medical Department, Army of the United States, who is the Chief of the Tropical Disease and Malaria Control Section in the Division of Preventive Medicine. His subject will be Malaria and Its Influence on World Health.

The lecture is open to the general public and is in memory of Dr. Hermann M. Biggs, late Commissioner of Health in the New York State Department of Health and a distinguished physician of New York City.

N.T.A. APPOINTS WAR EMERGENCY COMMITTEE

The National Tuberculosis Association, New York, N. Y., has announced the appointment of a War Emergency Committee for the purpose of keeping tuberculosis control programs adjusted to wartime conditions and to plan for post-war control of the disease.

The chairman of the committee is Dr. J. Burns Amberson, Jr., president of the association, and other members are Dr. Harry S. Mustard, director, Delamar Institute of Public Health, Columbia University; Lt. Col. Esmond R. Long, M.D., in charge of the Tuberculosis Section in the Office of the Surgeon General, U. S. Army, who is on leave from his place as director of the Henry Phipps Institute, Philadelphia; Dr. Herman E. Hilleboe, in charge of the Tuberculosis Section, U. S. Public Health Service, and Robert G. Paterson, Ph.D., executive secretary, Ohio Public Health Association.

LAND-FILL GARBAGE DISPOSAL METHOD IN PATENT LITIGATION

The *Public Works Engineers' News Letter* for January indicates that the sanitary land-fill system of refuse disposal practised at New York City has become the basis of a patent infringement suit filed on December 18. The holder of the patents covering the land-fill method, Lewis M. McCarthy of New York City, originally made application on November 6, 1933, and was granted patents on August 4, 1936, and on July 4, 1939, relating to the disposition of refuse by dumping and covering the material with earth excavated from a trench directly in front of the filled area.

New York City has made extensive use of land-fills during the past 6 years, reporting that approximately 11,000,000 cu. yds. of refuse were disposed of by this method in 1941 at an average unit cost of $0.069 per cu. yd. This cost is approximately 30 per cent of New York's cost of disposal by incineration. Widespread adoption of the land-fill method at army cantonments has been reported during the past year.

MASSACHUSETTS PUBLIC HEALTH ASSOCIATION

The Massachusetts Public Health Association held its annual meeting on January 28 in Boston electing the following officers:

President, Harold W. Stevens, M.D.
1st Vice President, L. Jackson Smith, M.D.
2nd Vice President, Charles F. Wilinsky, M.D.
Secretary, Raymond S. Patterson, Ph.D.
Treasurer, Elna I. Perkins, M.S.
Executive Committee, Manfred Bowditch, A.B.; Ethel G. Brooks, R.N., B.S.; G. Donald Buckner, S.B.; Roy F. Feemster, M.D.; John W. Williams, M.D.
Representative to the Governing Council of the A.P.H.A., Charles F. Wilinsky, M.D.; (Alternate) Alton S. Pope, M.D.
Representatives to Executive Committee elected by Sections to serve for 1943, Board of Health Section, Vlado A. Getting, M.D.; Laboratory Section, Donald L. Augustine, Sc.D.; Child Health Section, Sallie H. Saunders, M.D.; Food and Nutrition Section, Dorothy Duckles Hudson.

Henry D. Chadwick, M.D., retired as President after two terms. G. Donald Buckner of Worcester retired as Secretary-Treasurer on account of his removal to Worcester to become the Secretary of the Southern Worcester County Health Association. He has served as Secretary since 1934.

DR. FELIX J. UNDERWOOD

The December issue of the *Mississippi Doctor,* the official organ of the Mississippi State Medical Association, carries an editorial dedication to Felix J. Underwood, M.D., State Health Officer, in recognition of the honor that has been bestowed upon him in his election as President-elect of the American Public Health Association at the 71st Annual Meeting of the Association in St. Louis last October.

NEW MEXICO HEALTH CONFERENCE

On January 18 a medical and public health conference was held in Albuquerque, N. M., with participation from members of the staff of the U. S. Indian Medical Service, the New Mexico Third Health District, and the New Mexico Department of Public Health. Emphasis was put on immunization procedures, on sulfaguanadine in treatment of dysentery and on practical application of nutrition, with particular reference to native plants. Dr. Ralph B. Snavely, District Medical Director for the Office of Indian Affairs, presided.

PAINLESS CHILD BIRTH

A new type of spinal anesthesia has been announced for use in obstetrics, which has been developed by Robert A. Hingson, M.D., and Waldo B. Edwards, M.D., officers of the U. S. Public Health Service stationed at the Marine Hospital at Stapleton, Staten Island, N. Y.

According to the *Journal of the American Medical Association* for January 23, the technic involves continuous caudal analgesia with a solution of metycaine. They report 589 deliveries without maternal mortality and with but three infant deaths, all without reference to the method of alalgesia employed.

DR. NEUPERT APPOINTED WISCONSIN STATE HEALTH OFFICER

Carl N. Neupert, M.D., has been appointed State Health Officer of Wisconsin to succeed Dr. C. A. Harper. He has been a member of the staff of the State Board of Health since 1936. Dr. Neupert was born in 1897, and is a graduate of Washington University School of Medicine, St. Louis, Mo., 1925.

CORRECTION

The attention of the Editor has been called to the fact that the listing of Baccalaureate degrees awarded in public health nursing for the academic year ending June 30, 1942, by the University of Minnesota as presented on page 1364 of the AMERICAN JOURNAL OF PUBLIC HEALTH for December, 1942, and as compiled from figures assembled by the National Organization for Public Health Nursing, is in error. Instead of 378 degrees granted, the figure should be 51.

PERSONALS

Central States

CLIFFORD J. BALDRIDGE, M.D.† Health Commissioner of the City of Hamilton and Butler County, Ohio, for 20 years, has resigned, effective January 1.

DANIEL C. BARRETT, M.D., C.P.H.,† formerly of Bloomington, Ind., has been detailed by the U. S. Public Health Service to serve as Health Officer of Montgomery County, with headquarters in Independence.

ALLEN A. FILEK, M.D.,† who has been District Health Officer in Green Bay, Wis., has been appointed Director of the Division of Tuberculosis and the Division of Local Health Services of the State Board of Health. He succeeds EDWIN H. JORRIS, M.D.,† who has joined the armed forces.

W. R. GIEDT, M.D., M.P.H.,† formerly Director of Laboratories, South Dakota State Board of Health, Pierce, S. D., was appointed Assistant State Health Officer, October 1, 1942. He succeeds G. J. VAN HEUVELEN, M.D., who entered the Army. Upon the death of J. F. D. COOK, M.D., Superintendent of the State Board of Health, Dr. Giedt was designated as Acting Superintendent until a successor to Dr. Cook is appointed.

SIMON A. KING, M.D., has been named Health Officer of North Dansville, N. Y., to succeed ALDEN J. TOWNSEND, M.D., who resigned to enter military service.

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* Fellow A.P.H.A.
† Member A.P.H.A.

GREGORY J. NORDENBROCK, M.D., of St. Marys, Ohio, has been appointed Health Commissioner for Shelby County, effective December 15. He succeeds HARRY WAIN, M.D.,† of Sidney, resigned.

S. L. PEARLMAN, M.D., M.S.P.H.,† P.A. Surgeon (R), U.S.P.H.S., has been transferred from the Health Department of Omaha, Nebr., where he served as Communicable Disease Control Officer to the Health Department of Chicago, Ill., as Director of Venereal Disease Clinics.

HERBERT L. PETTITT, M.D., of Morrison, Ill., who recently resigned as Assistant State Health Director to resume private practice, has been appointed Chief of Emergency Medical Services in the Illinois Defense Council. He succeeds ROLAND R. CROSS, M.D.,† of Springfield, State Health Director. Dr. Pettitt will devote only part time to the position.

ROBERT W. REID, M.D., of Union City, Ind., has been appointed Health Officer of Randolph County, to succeed ANDREW M. BRENNER, M.D., of Winchester, who has entered the Navy.

GARFIELD A. REUTTER, M.D., formerly of Bigfork, Minn., is the new Health Officer of Cherokee County.

Eastern States

W. RODERICK BROWN, M.D., Pittsburgh, Pa., has been appointed to the staff of the Medical Division, Office of Civilian Defense, Washington, D. C., to supervise the training of Negro physicians in emergency medical service for civilian defense. Dr. Brown has been a member of the medical staff of the Tuberculosis League of Pittsburgh and the Chest Unit of the University of Pittsburgh Medical Center.

WILLIAM J. CARRINGTON, M.D., of Ventnor, N. J., Vice-President of the American Medical Association, has been commissioned a lieutenant-colonel in the Army Medical Corps and expects to take charge of an Army hospital soon.

MRS. INA J. DURFEE, of Dedham, Mass., was appointed Executive Secretary of the Hartford Tuberculosis and Public Health Society, Inc., on January 14, to replace S. DOUGLAS POLHEMUS † who has gone into the Army.

GENE B. HABER, M.D., Passed Assistant Surgeon, U. S. Public Health Service (R), has been assigned to the New Hampshire State Board of Health and is serving as health officer of the Eastern Health District with offices in Exeter, N. H. He replaces EDWARD W. COLBY, M.D.,† who is now in charge of the Division of Epidemiology and Venereal Disease Control at the State Headquarters, in Concord.

DR. HENRY C. SHERMAN, of Columbia University, New York, N. Y., delivered the Mary Swartz Rose Memorial Lecture on February 17 at the New York Academy of Medicine. The subject of the lecture was "The Concept and Practical Significance of Internal Environment." The meeting was sponsored by the Greater New York Dietetic Association.

RACHEL E. SPINNEY, M.S.P.H.,† who has been Health Education Secretary with the Hartford Tuberculosis and Public Health Society, Hartford, Conn., has resigned to accept a position with the Tuberculosis Institute of Chicago and Cook County, Ill., as Director of Health Education.

A. HAMILTON STEWART, M.D.,† of Indiana, Pa., has been appointed Secretary of Health of Pennsylvania, as announced by Governor Edward Martin. Dr. Stewart has served during the last 4 years first as Deputy Secretary then as Acting Secretary and finally as Secretary during the

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last month of the preceding administration of Governor James.

Southern States

CAROLINE H. CALLISON, M.D.,† of Chatom, Ala., will serve as Health Officer of Washington and Clarke Counties.

JULIUS E. DUNN, M.D., of Florence, Ala., is the new Health Officer of Etowah and Calhoun Counties, with headquarters in Anniston.

JEAN HENDERSON,† formerly Public Relations Consultant with the Florida State Board of Health, Jacksonville, has been appointed Information Consultant to the Health and Medical Committee, Office of Defense Health and Welfare Services, Washington, D. C.

KATHARINE F. LENROOT,* Chief of the Children's Bureau, U. S. Department of Labor, Washington, D. C., was awarded the Rosenberger Medal for "notably great service in the promotion of human welfare," at the University of Chicago on December 18.

PERRIN H. LONG, M.D., Professor of Preventive Medicine at Johns Hopkins University School of Medicine, Baltimore, Md., has received the award of the Southern Medical Association for original work by one of its members. The award was made in recognition of his studies on the sulfonamides.

G. FOARD MCGINNES, M.D., DR.P.H.,* has been appointed Medical Director of the Midwestern Area of the American National Red Cross with headquarters in St. Louis, Mo., effective February 15. Dr. McGinnes is a graduate in medicine of the University of Virginia and in public health from Johns Hopkins. He has served with the Virginia State Department of Health and the State Department of Health of Tennessee, where he recently has been Director of the Venereal Control Division. For several years Dr. McGinnes was Secretary of the Southern Branch, American Public Health Association.

ELISHA MOORE, M.D., of Livingston, Health Officer of Sumter County, Ala., has also been placed in charge of the Greene County Department of Health.

RALPH E. TARBETT,* Chief Sanitary Engineer of the Office of Civilian Defense, has been recalled to the U. S. Public Health Service by the Surgeon General. He will assume direction of the Federal Facility Security Program as it relates to domestic water supplies, responsibility for which was assigned to the Public Health Service by Executive Order of President Roosevelt on May 19, 1942. GORDON E. MCCALLUM, Assistant Chief Sanitary Engineer, has been named to serve as Acting Chief Sanitary Engineer in the Office of Civilian Defense, in place of Mr. Tarbett.

FRANK B. WOOD,† Engineer (Sanitary), with the U. S. Engineer Department, was transferred on January 1 to the office of the Mississippi River Commission and the Lower Mississippi Valley Division at Vicksburg, Miss., from the Vicksburg, Miss., District.

Western States

LT.-COL. GEORGE H. HAM, of Culver City, Calif., has been appointed Base Surgeon at the Army Air Corps Base in Key Field, Miss. He has been located in Washington, D. C., while serving as The Surgeon, of the Ferry Command.

Canada

ADA I. WALLACE, M.D., Medical Health Officer for Emerson and the rural municipalities of Franklin and Mont-

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† Member A.P.H.A.

calm, was recently appointed first woman Coroner in the history of Manitoba, it is reported.

DEATHS

GEORGE WASHINGTON CRILE, M.D., of Cleveland Heights, Ohio, world renowned surgeon, died January 7, at the age of 78.

DR. LEE HOLLISTER FERGUSON, Director of Health Service for Western Reserve University, Cleveland, Ohio, died January 27.

WILMER KRUSEN, M.D., of Philadelphia, Pa., died February 9. He had served as Director of Public Health of Philadelphia, and became President of the Philadelphia College of Pharmacy and Science in 1927, and was President-emeritus since 1941.

DR. EZRA KIMBALL SPRAGUE, former Medical Director of the North Atlantic District of the U. S. Public Health Service, died February 2, in Brooklyn, N. Y.

CONFERENCES AND DATES

American Association of School Administrators. St. Louis, Mo. February 26–March 2.

American Association of Social Workers. Cleveland, Ohio. May 22–23.

American Society of Planning Officials. Joint Meeting of National Conference on Planning and American Institute of Planners. New York, N. Y. Week of May 17.

American Water Works Association—
Minnesota Section—Nicollet Hotel, Minneapolis, Minn. March 12 (from noon)–13.
New York Section—Hotel Syracuse, Syracuse, N. Y. March 25–26.
Canadian Section—Royal Connaught Hotel, Hamilton, Ontario, Can. April 7–9.
Pacific Northwest Section — Bellingham, Wash. May 7–8.
Conference on War Winning Water Works Operations. Carter and Statler Hotels (co-headquarters), Cleveland, Ohio. June 15–18.

Civil Service Assembly — Western Regional Conference. Yosemite National Park, Mariposa, Calif. June 5–6.

Greater New York Safety Council—14th Annual Convention. Pennsylvania Hotel, New York, N. Y. March 23–25.

Idaho Public Health Association, Boise, Idaho. May 31–June 1.

Illinois Public Health Association. Chicago, Ill. May 17–18.

Iowa Public Health Association. Des Moines, Iowa. April 27–28.

Massachusetts Public Health Association. Boston, Mass. April 29.

National Association of Housing Officials. Regional IV. Savannah, Ga. March 18–19.

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